

The Technology Review

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Number 2

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technology review

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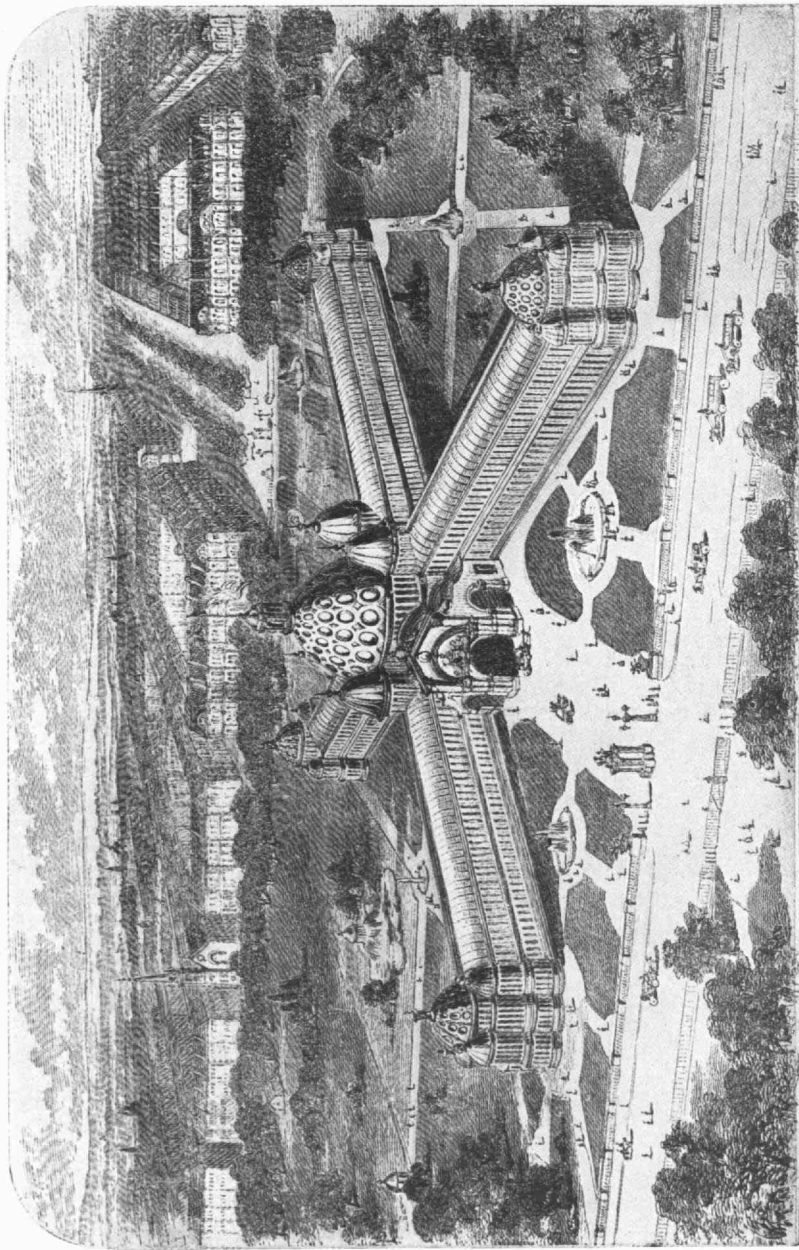
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Proposed Massachusetts Conservatory of Art, Science, and Historical Relics.

WM. WAUD, ARCHITECT, FROM SUGGESTIONS BY WM. E. BAKER.

The Technology Review

VOL. IV.

APRIL, 1902

No. 2

THE CONSERVATORY JOURNAL

It has been customary to refer to *The Spectrum*, published by the students of the Institute of Technology in 1873, as the first of that honorable line of Institute periodicals of which the REVIEW is the latest that has appeared. Priority may be justly claimed, however, for the *Conservatory Journal*, a weekly newspaper issued at fortnightly intervals in 1859. The Institute had then no being: nevertheless, this paper supported as vigorously its projected *Conservatory of Art and Science* as does the REVIEW the established Massachusetts Institute of Technology of to-day.

The first number of the *Conservatory Journal*, which was a four-page sheet, twenty-four inches by eighteen inches in size, appeared on April 9, 1859, and was followed by No. 2, on April 23; Nos. 3 and 4, on May 7; No. 5, on May 21; No. 6, on June 4; and No. 7, on June 18, No. 7 being, it is believed, the last issue of this journal to be published.

A short life, even for a newspaper established for the promotion of a special end, yet a life full of excitement and doubtless of expense to its author and publisher. The title:

CONSERVATORY JOURNAL.

DEVOTED TO ESTABLISHING A

Massachusetts Conservatory of Art, Science, and Historical Relics.

VOL. I.

BOSTON, APRIL 9, 1859.

NO. 1.

"Alere flamman ; non nobis solum sed omnibus."

To feed the flame; not for ourselves only, but for all.

announced the aim of the Periodical, which was somewhat more fully set forth in the editorial column of the first issue by the "Editor, Proprietor and Publisher," as follows:—

With hope of aiding the cause in which we have enlisted, we—the editor, proprietor and publisher—offer this Journal of Proceedings to establish a Massachusetts Conservatory of Art and Science. Journalists will please understand that we do not pretend to enter the ranks of the editorial fraternity; we confess ourselves driven to this course by our ardent desire to aid in establishing this great Educational Institution. Our work is endorsed by the names of near ten thousand signers of memorials to the Legislature in aid of this plan, the greater portion of whose names will be found herein. Every one of these signers has thus signified and declared his or her readiness to co-operate in the work. Ladies and gentlemen, we hold you to your promise; you have endorsed a note upon the sympathies and pockets of all your friends for the entire success of the plan. We expect to have an early report of the result of your individual influence. Not one of you can with any honor free yourself from your written obligation. Some of you can obtain consent of those having relics of great historical value, articles of stone, wood, iron, or other

metals and inventions, to forego the selfishness of individual enjoyment, and agree to deposit them in a fire-proof structure that will be erected for the Conservatory of Art, Science, and Historical Relics. Some have portraits, old paintings, records, and other articles, which are of great value as family relics; may not such as are of public interest be deposited where hundreds, yea thousands, can observe and study the characteristics of the past? Some have coins, minerals and curiosities of the animal and vegetable kingdom; will not such signify their willingness to deposit them where others may see, study and admire? Many have coins and bank-notes that would be very useful in erecting an imposing structure to contain the really priceless relics; is there not a much greater pleasure in appropriating these for the benefit of all, than in burying the talents in the pocket? Diogenes had no need of turning his lantern toward a man who kept his hands in his pockets. Ten thousand signatures represent ten thousand pockets, and a kind of compound influence over portemonnaies, pocket-books, and bank accounts. Thus we must hasten to adopt some plan for a structure. We have artists hard at work, and hope to present the plan of a structure, that we think would be suitable for such purposes, in our second edition, which we expect to issue on the 15th inst.

May we not expect the aid of every man and woman throughout the State in establishing this Conservatory of Art, Science, and Historical Relics, that will grow to be even more national than State in its influence? . . .

We need, then, a Polytechnic Institute, where the advancement of the useful arts may be noticed and practically described. Where may be properly organized a school of design to increase our supremacy as a manufacturing State. Wherein could be opened a *Conversazione* which would tend to disseminate useful knowledge upon subjects of every day life, upon domestic and political economy, etc. How and where to build a house, so as to be free from obnoxious miasma arising from certain soils which are so injurious to health, and which so insidiously,

yet surely, shorten life. How to light, heat, and ventilate a house, and the chemical analysis of atmospheres, are yet to be made subjects of popular consideration.

We need liberal accommodations for the display of specimens of Natural History, of the implements of Agriculture and Horticulture, the Fine Arts, and other articles pertaining to the history of our State. Other wants we would much like to suggest in detail, but must leave to the imagination, by reason of the continued and somewhat perplexing cry of "More copy — time's up!"

The meeting at which the memorials referred to were authorized was held Feb. 18, 1859.* The memorial itself was as follows:—

MEMORIAL

To the Legislature of Massachusetts in Relation to a Conservatory of Art and Science.

The undersigned, a Committee appointed by citizens of the Commonwealth, at a meeting held Feb. 18th, 1859, in the rooms of the Boston Society of Natural History, composed of individuals representing Associations of Agriculture, Horticulture, Art, Science, and various Industrial, Educational and Moral Interests of the State, were instructed to prepare a Memorial to your Honorable Body, in concert with a Committee representing the Boston Society of Natural History, setting forth the wishes of the various Associations represented at this meeting, as well as to confer with others not present, in a general plan of co-operation, and to second and aid in carrying out the wise and liberal suggestion of his Excellency, the Governor, in his Address alluding to the propriety of appropriating for Educational purposes the proceeds of Sales of the Back Bay Lands belonging to the Commonwealth, lying near the Public Garden in the City of Boston. The said Committee respectfully represent to your Honorable Body, that in

* See the TECHNOLOGY REVIEW, iii. 401.

our opinion a most effective method of making those Lands available in promoting education, as well as directly developing the wealth of the State, would be for the Legislature to pass a *Resolve* reserving from sale a portion of said lands, and dedicating them as a space to be used in all coming time, for the erection of a building or buildings, by various Institutions for public benefit, which in the aggregate would constitute and might be known as the Massachusetts Conservatory of Art and Science.

The Committee, without undertaking to specify in detail the extent of space to be reserved, or the specific purposes to which it should be dedicated, would simply suggest the character of a few leading Institutions, which, if once established on the ground, would form a nucleus around which would cluster kindred Associations of immense value to the people of the State. Taking the Commissioners' Plan of the Lands as a basis for illustration, we would suggest the reservation of as much as four squares for this purpose :

Section No. 1, might be devoted to collections of Implements, Models, and other objects pertaining to Agriculture, Horticulture, and Pomology.

Section No. 2, to Natural History, Practical Geology, and Chemistry, with ample room for museums of specimens.

Section No. 3, to those Institutions devoted to the development of Mechanics, Manufactures and Commerce.

Section No. 4, to Fine Arts, History, and Ethnology.

The space reserved for each section should be ample for these and all Institutions of a kindred character, which the future progress of the State may develop. By associating such Institutions in one locality, they would be reciprocally benefited by means of a free and ready interchange and use of their respective collections of specimens, and thus avoid the inconvenience of having the same objects in several collections; each one could confine its

operations to a specialty. A still greater advantage would result by having these established at one point and in the metropolis, where they would be accessible to all the people of the State instead of being elsewhere, or scattered, as must necessarily be the case, unless we secure this rare opportunity to bring them together. It is not proposed to merge the different Institutions in one,—the perfect individuality of each being retained in every respect, having nothing necessarily in common but the general fostering care of the State, in granting the use of the land, in return for which the people will have a common interest in the advantages to be derived.

It is not proposed that the legal title to the land be conveyed, but the fee to remain in the State, the various Institutions enjoying only a grant of land for their respective specific purposes, subject to its reversion to the State whenever the grantees cease to use it for the object specified in the grant.

The Committee have reason to believe that there are now existing several well-established Institutions, which will avail themselves of the privilege under the reservation, if made, and will erect a building or buildings thereon for their respective uses as soon as the land can be put in readiness for occupation.

It is also known to the Committee that there are at this time large collections of specimens of Natural History, Fine Arts, Models, and Designs of great public value in the possession of private individuals, and now not accessible to the public, which could be congregated here without purchase, provided suitable buildings were erected for their reception.

In conclusion, the Committee, while heartily sympathizing with the efforts now in progress to form a Museum of Natural History and Comparative Zoölogy, under the auspices of Professor Agassiz, at Cambridge, for the development of abstract science, desire to co-operate with such labors in the building up of Institutions of a more directly practical character, which will enable the masses of the

people, engaged in industrial occupations, more effectually to avail themselves of the advantages to be derived from the labors of those who are wholly devoted to purely scientific research.

MARSHALL P. WILDER, GEO. W. PRATT, SAM'L H. GOOKIN, ALFRED ORDWAY, WM. E. BAKER, B. F. EDMANDS, M. D. ROSS,	}	<i>Committee.</i>
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BOSTON, March 9th, 1859.

The history of this Memorial subsequent to the meeting of February 18 and prior to the issue of the first number of the *Conservatory Journal*, sufficiently appears in the following extracts from that publication:—

The Committee appointed by the Boston Society of Natural History, who had presented a memorial to the Legislature for the reservation of land for these general purposes, and the general Committee of seven above mentioned, had a hearing before the Committee on Back Bay lands at the State House on March 10, 1859. . . .

At a second meeting of gentlemen interested in the proposed Conservatory of Art and Science, held at the Library of the Boston Society of Natural History, on Friday, March 11, at 7 1-2 o'clock, Hon. Marshall P. Wilder in the chair; the Committee appointed at the first meeting made a report of their doings since Feb. 18.

On motion of Wm. E. Baker, eight gentlemen were added to the original Committee of seven—making the Committee consist of Hon. Marshall P. Wilder, George W. Pratt, Sam'l H. Gookin, Alfred Ordway, Wm. E. Baker, B. F. Edmands, M. D. Ross, E. S. Tobey, James M. Beebe, B. S. Rotch, Dr. S. Cabot, Jr., Amos Binney, Dr. S. Kneeland, Jr., Charles L. Flint, and J. D. Philbrick. . . .

J. D. Philbrick, Esq., spoke of the vast importance of our system of education, the influence of which had made itself felt not only to the extreme limits of our own country, but even in the old world. We had originated the first Normal School, which he considered the greatest step yet made in the method of instruction; let us go a step farther, and establish the first truly Polytechnic School, which shall bring within the reach and understanding of all the results of abstract science. A petition of the American Institute of Instruction, signed by the most influential friends of Education in the country, would be presented in aid of the memorial.

The Committee on the memorial to the Legislature for a reservation of land on the Back Bay, for the use of the associated Societies of Science and Art, had a second hearing on Tuesday, March 15, before the Back Bay Committee.

Prominent among the speakers and gentlemen present were Hon. Marshall P. Wilder, Rev. Mr. Waterston, Messrs. George B. Emerson, B. S. Rotch, E. S. Tobey, J. D. Philbrick, C. K. Dillaway, M. D. Ross, Wm. E. Baker, C. A. Cummings, A. Ordway, J. Preston, R. W. Hall, G. Twitchell, John Jeffries, Jr., and Drs. C. T. Jackson, and S. Cabot, Jr.

Rev. Mr. Waterston referred in a most eloquent and convincing manner, to the advantages of such institutions already established in the Old World, and to the necessity for them in this country, if we ever hope to reach any high level in the ornamental arts. In London, the city of the world, the strangers who throng the streets come not so much to behold its immense crowds and its fine buildings, as to enjoy the advantages of its great and free public institutions. . . .

He thought there was one feature in this memorial which would commend it to the favorable consideration of all, viz: its coming from a *union* of associated Institutions; free from the cliques and jealousies which embarrass so

many of our charitable and educational associations. It is a grand sight, and the first in this Commonwealth, to see time-honored and useful societies coming forward to pour their treasures into the lap of the State, and their united voices asking the privilege of establishing an Institution for the great object of popular education. They do not ask for endowment, nor for the purchase of costly collections; these they have already; they ask only for land upon which private munificence shall erect buildings for the safe keeping of their treasures — they have the Archimedean lever in their hands; if the State will only grant them the land to stand upon, they will soon move this old Commonwealth such a step in advance that we cannot justly estimate its extent at the present time. . . .

The greater part of this first number of the *Journal* was taken up with memorials and their appended signatures, many of weight and influence, from such institutions as the Boston Society of Natural History, the Massachusetts College of Agriculture, and the Art Club from representatives of institutes of instruction, manufacturing interests, Christian associations, railroad interests, merchants, and clergymen. Moreover, there are citizens' lists from no less than thirty-eight cities and towns of Massachusetts. Finally there is a "Ladies' List," led by Mrs. Harrison Gray Otis, in which hundreds of women are enrolled; and it is difficult to believe that only forty years have elapsed since these ladies felt it necessary to qualify their Memorial with the statement that "The undersigned think it is not overstepping the boundaries of feminine delicacy, in this instance, to unite their voices to the general approbation of the objects set forth in the Society's memorial. Feeling a natural and peculiar interest in whatever is beautiful in Nature and Art, we hail this movement," . . . etc.

Accessory to the main object of the *Journal* was a lesser aim, that of promoting

A CONSERVATORY OF ART FESTIVAL AND EXHIBITION:

It is suggested to have a Festival and Exhibition of works of Art, specimens of Natural History, of the Mechanic Arts, etc., in the Music Hall, Boston, commencing about the middle (probably the 18th) of May, the object being to form a miniature Conservatory of Art, Science, and Historical Relics, to create a popular interest, and thus commence the pecuniary foundation of the work. Those having articles in any way valuable, as specimens of Natural History, Agriculture, Horticulture, (not perishable); works or implements of the fine or useful Arts, Paintings, Portraits, Statues, and other relics referring to American subjects, inventions — old and modern — are earnestly solicited to aid in the work by signifying their willingness to loan them for the purpose of exhibition, which will probably continue during several weeks. Contributors will receive a season ticket to the Exhibition. Those subscribing ten dollars to the fund for defraying the expenses, which must necessarily be large, will receive a ticket admitting a gentleman and two ladies to opening day of the Festival, and season ticket during Exhibition. At the Festival opening of the Exhibition — which may possibly be continued during three days — seven distinguished gentlemen have promised to preside, and the management will be under the direction of twenty-five gentlemen and twenty-five ladies. Those who signify their willingness to loan such articles as are appropriate for the Exhibition, by Wednesday, 13th inst., will be noticed in the next issue of this *Journal*. Direct all communications on this subject — addressed Conservatory Festival — to the *Office of the Massachusetts Conservatory of Art and Science*, 16 Summer Street, Boston.

Finally, at the end of the last column of the issue is re-

vealed the name of the "Editor, proprietor and publisher" in the request that

All persons, disposed to aid in any way in forwarding this truly great National Work, can direct their communications to

WM. E. BAKER,
16 SUMMER ST., BOSTON.

In the second number Mr. Baker's name appears at the head of the editorial column

Conservatory Journal.

WM. E. BAKER, EDITOR AND PUBLISHER.

PUBLISHED AT THE

OFFICE OF THE CONSERVATORY OF ART AND SCIENCE,
Summer Street, Boston.

BOSTON, SATURDAY, APRIL 23th, 1859.

and the plans of the editor are still more fully expounded:—

In this, our second issue, we again record that we make no pretensions as to fitness for the complicated duties of a Journalist, and that we have been led aside from our legitimate business vocations to usurp this our present peculiar and undesired public position, from our ardent wish to co-operate in establishing a Massachusetts Conservatory of Art, Science, and Historical Relics; to found an institution that, free from all *exclusiveness*, shall be open to the great influx of foreigners settling with us,—to grant them the influences of rational communion in the thoughts and acts of the expounders of Literature, Art, Science, and Government,—to amuse both old and young,—to direct

and guide the minds of all in our schools, and such as, from its peculiar recreative and alluring characteristics, would commend itself to the tastes of the general public, home and visitant. . . . Believing the time for action has come, and relying upon the influence and assistance of various distinguished gentlemen, well known as promoters of Art, Science, and History, we have taken the pecuniary responsibility of leasing all that part of the granite front building, on the corner of Summer and Chauncy Streets, (opposite the present post office) owned by the Joshua Sears estate, for the purpose of opening a Conservatory of Art, Science, and Historical Relics Exhibition; relying upon the encouragement of the people of the State, and wheresoever elsewhere resident, interested in the establishing such an Institution as is suggested, to render it attractive by *loan* of private collections appropriate for the purpose; and by the *contributions* of the animal and vegetable kingdom for deposit *permanently* in the commodious structure which will be erected for the Conservatory.

The building we have leased will serve as a nucleus of collections, and during the time necessary to erect the permanent structure desired for the Conservatory, will be suggestive of requisite preliminary arrangements in establishing such an Institution.

It is intended to arrange the building now taken, into various departments, one as Polytechnic, or for specimens of the Mechanic Arts — Manufactures from the raw materials to the finished fabric; Commerce in all its details of woods, metals, and chemicals employed in ship-building, of models of ships and all their appurtenances; another for Agriculture, Horticulture, and Pomology, implements used therefor and curiosities of the science. One for Natural History — specimens of the Vegetable and Animal Kingdom, both dead and living; one for Historical Relics; one for Fine Arts; and a lecture room, where it is intended to have short lectures upon the subjects found in the various departments, for which service several distinguished gentlemen have volunteered.

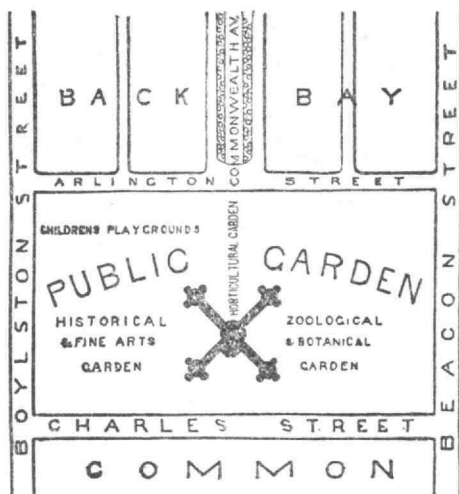
The building has floor surface of over *thirty-nine thousand five hundred square feet*; the rooms are high studded, and it is otherwise quite well adapted for the purposes required. All the benefits from lectures, concerts, admission to exhibition, or otherwise, will go towards acquiring appropriate works of Art and other articles, and to the Fund for erecting the structure proposed for the Conservatory. The entire proceeds from the building will be under the supervision and direction of five gentlemen, who will act as a Committee on Finance.

The building is now ready for the reception of articles, and it is desirable that all disposed to aid the cause, should send their contributions or their collections for deposit, without delay, that the exhibition may be opened as early as possible.

It is to be hoped that Journalists will give their valuable aid in favor of this commendable work, to establish an Institution for the *people*.

In this number, also was published a "General Plan of the Conservatory":—

GENERAL PLAN OF CONSERVATORY.



and there appeared a more detailed statement relative to the

CONSERVATORY OF ART, SCIENCE, AND HISTORICAL RELICS, IN SUMMER STREET.

As stated elsewhere, we have taken the pecuniary responsibility, and leased the new Granite Building belonging to the Joshua Sears estate, at the junction of Summer with Chauncy Street, Boston. There is near twice as much available space as at the Boston Music Hall, which, as noticed in our last issue, it was intended to arrange for the purposes above. The intention is to form the nucleus of collections, create popular interest, and make preliminary arrangements for the permanent structure that will be erected for the purpose.

Those having articles in any way valuable, as specimens of Natural History, Agriculture, Horticulture (not perishable); works or implements of the fine or useful Arts, Paintings, Portraits, Statues, and other relics referring to American subjects, inventions—old and modern—are earnestly solicited to aid in the work, by signifying their willingness to loan them for the purpose of exhibition.

As the necessary alterations, decorations, etc., will prove no small item of expense, we hope to have the encouragement and aid of those well disposed. Subscriptions of ten dollars will admit a gentleman and two ladies to the Festival opening and season admittance (until Sept. 1, 1859), to the Conservatory Exhibition, and to such lectures and concerts as the Committee may hereafter determine. Those subscribing five dollars, will have season tickets admitting one gentleman and lady to the Conservatory, and to lectures, etc., as above.

At the Festival opening, seven distinguished gentlemen have promised to preside, and a celebrated military band have offered their services to the cause, and quite a number of well-wishers have volunteered to lecture.

We want *every one* to take an interest and obtain the loan or contribution of such articles as would be appropri-

ate for exhibition. Anything curious in Nature or Art will be gladly received, either for loan or as a contribution to be sold, or as a permanent deposit for the CONSERVATORY.

The building is *now* ready for reception of articles, and no time should be lost in forwarding contributions, which should be addressed "CONSERVATORY, *Summer Street, Boston.*" The managers of the Worcester Railroad have offered to transport, *free*, any articles intended for the Conservatory; and it is probable other railroads will make the same offer. Every precaution will be taken in arranging articles,—all small articles will be enclosed in glass cases, well secured. There will be a detective police during the day and evening, and watchmen during the night, and these last will be forced to faithful discharge of duty, by means of the very ingenious watch-clock, to be deposited by Messrs. E. Howard & Co.

Many distinguished gentlemen have consented to serve on committees, and with associate managers who will be announced hereafter, will have the supervision and direction of the several departments of History, Natural History, Commerce, Agriculture, Horticulture, Mechanics and Manufacturers, Fine Arts, and Finance. . . .

There is also in this number an illustrated "Liberal Offer," the pictorial part of which served to fill nearly half a page of space:—

LIBERAL OFFER.

TO PROVIDE ANIMALS FOR THE ZOÖLOGICAL GARDEN.

Boston, April 12th, 1859.

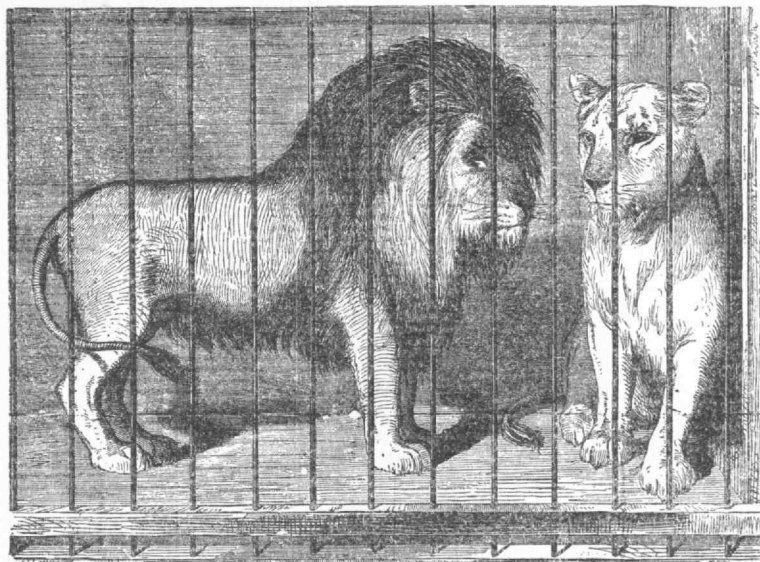
To Wm. E. Baker, Esq.

DEAR SIR:—According to our conversation and your request, I hereby reiterate my great sympathy with that part of the plan for establishing a Conservatory referring to a Zoölogical Garden. I have for a long time been very desirous that some measures should be taken to establish a

Zoölogical Garden, where the children attending the public schools could have an opportunity to study the habits of the animal kingdom. It is a source of great regret that we have not one single Zoölogical Garden in the United States, while every great city on the continent of Europe can boast of such Zoölogical collections as attract strangers from a great distance. Literally and truthfully the greatest attractions of these cities are proved to be the "Lions of the place." Why may not Boston vie with any city in her collections of the animal kingdom? The Public Garden would be a very suitable place for such purposes as are suggested in your plan for a Conservatory of Art, Science, and Historical Relics, and if it should be appropriated for the purpose, I will endeavor to show my interest in more than a theoretical expression.

I have now on exhibition in Portland Street, Boston, a collection of animals consisting of six African Lions, one Leopard, one Jackall, Lynx, Coyote, Wild Cat, Ant-Eater, two Limas, one Hyena, Civit, two Alpaccas, Prairie Wolf, twenty varieties of Monkeys, Anaconda from Congo River, Crocodile from Egypt, Mountain Cat from California, and various other small animals and birds, which collection and appurtenances I value at \$20,000. I will consent that a committee of three disinterested persons, familiar with the price of animals of this kind, shall set a value on the collection, and at the price set by these referees I will contribute the collection to the Conservatory if located in the Public Garden, Boston, receiving my pay therefor in admittance fees, and when said specified value of the collection is thus received, with necessary expenses for attending the same up to the time of its receipt, the entire collection shall be considered as the property of the Conservatory, and I am willing to devote myself to the procuring of other animals, for which duty I believe myself qualified from an experience of forty years in collecting wild animals.

JOHN SEARS.



LION AND LIONESS NOW IN THE COLLECTION OF JOHN SEARS.

Interspersed through this number are sundry colloquies with the reader which help to illustrate the editor's point of view:—

We would never be tempted to become a journalist for money. It is with us, as is often the case, our great interest in the cause we have espoused which has led us to attempt a work for which we do not feel ourselves able, and for which our many other calls for labor, do not give us time to prepare. We hope, then, we may have the indulgence of our friends, as to our editorial articles, for we are working many more hours than we would be tempted to work for ourself. In contracting with carpenters — painters — decorators, etc., etc., we have so little time to prepare our writings, that our compositors actually “struck” yesterday, declaring they could not decipher our copy.

We hope soon to obtain the services of a suitable Editor, that we may direct, rather than occupy so much of

our time in arranging details. We do not promise to illustrate the *Journal*, but we claim the privilege of doing so whenever we please to incur the expense. We have *yet* to learn that one dollar per annum will cover the cost of our paper and printing; and we therefore hope all who receive this will remember that the cost of one single paper, multiplied by hundreds—yea, thousands—given away, sums up to quite an amount that we take from the cause, if no return is made.

Incidents and Inconveniences of our Editorial Life.—Our last edition consisted of 12,500 copies. If all those who signed the memorials did not receive them, it was from an over-sensitiveness on our part as to paying one cent postage each, in addition to giving the paper, printing, and mental and physical labor. In attempting to change forms at 11 o'clock, the gear-bands broke, and we had trouble to convince that it could be repaired in time. Got forms shifted, and enough papers complete for our foreign call at 25 minutes to 12 M.,—(steamer left at 12),—expressed to East Boston, and our bag with papers, all previously stamped, was thrown on board over the stern, after the steamship had hauled off, as the stern rounded to. We write this to respond to an earnest call for copy to fill a column.

In the final column of No. 2 (reproduced on the opposite page) it appears that the *Journal* has come to stay.

The third and fourth numbers of the *Journal*, issued together as one eight-page paper, contained as a supplement a view of the proposed Conservatory (see frontispiece), designed, in accordance with Mr. Baker's suggestions, by Mr. William Waud. This design is thus explained:—

It will be observed, the plan of the structure is in the form of the Greek Cross, which admits of the *isolation* of the several societies, yet forms, in the aggregate, one grand architectural whole, that can be extended as may be re-

The Conservatory Journal

Will be issued on a medium sized sheet, every Saturday. Whenever other services in aid of establishing the CONSERVATORY OF ART AND SCIENCE prevent its regular issue weekly, it will be in double or quarto form on the following week.

We earnestly solicit the aid of all interested in establishing a

Massachusetts Conservatory of Art, Science, and Historical Relics, to subscribe for the Journal, and influence others to subscribe and contribute article for it.

The subscription is put at a price which will barely cover the prime cost of paper and printing. All the other work will be freely given; and if any one is familiar with the laborious and difficult duties connected with editing a Journal, we may expect both mental and pecuniary sympathy in a practical form.

Those disposed to subscribe to the CONSERVATORY JOURNAL, will write their names and addresses plainly, and address to "CONSERVATORY JOURNAL, BOSTON," enclosing One Dollar for each subscription.

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We earnestly request encouragement and aid in the cause to which we are wholly devoted, by Communications, Contributions, Statistics, etc., referring to Works of the Useful or Fine Arts, — to Science or History, in any part of the world.

WM. E. BAKER, EDITOR AND PUBLISHER.

Office, Summer Street, Boston.

PRESS OF THE

Franklin Printing House,

HAWLEY STREET, CORNER OF FRANKLIN, BOSTON,

Where are executed all kinds of

PLAIN, FANCY, AND ORNAMENTAL PRINTING

With Neatness, Cheapness, and Despatch.

quired, without destroying the effect, by intersecting gallery with gallery indefinitely. The arms of the cross, as now shown, would, to an extent, form divisionary lines for the Botanico-Zoölogical, Horticultural, Historical, and Fine Art Gardens.

We have desired to suggest a structure of such ornamental architecture, and so placed in the centre of a park laid out in gardens, as shall be of itself externally a feature, and internally conveniently arranged for the mutual advantage of the societies and associations, each preserving its individuality and distinct organization.

The material to be used in erecting this structure can be hereafter determined — whether iron and glass — white marble, iron and glass — or granite, with arched roof of alternate discs of iron and decorated glass. We prefer the latter. The arched roof should have a cap, or ventilating gallery, (not shown in our small engraving), three or more feet high and wide; this roof to be expressly constructed to guard against leakage, the snows of winter, and the heat of summer.

The four domes surrounding the rotunda would serve to relieve the outward pressure of the grand central dome, and add, at the same time, to the external effect; they would also permit the internal arrangement of the ends of the arms of the cross as ante-chambers to galleries, which could be shut off from the latter, if it should be desirable to open them into the rotunda for any civic or State gathering of ten or fifteen thousand persons.

It is not necessary to designate any precise dimensions; figures may be taken according as space may be required, keeping the symmetry of the form. Supposing the arms of the cross or galleries two hundred feet in length, and the diameter of the rotunda one hundred feet, the structure would occupy a square of less than six acres. The Public Garden enclosed about twenty-four acres, including the three acres of "disputed territory" adjacent to Arlington Street, recently added by the almost unanimous voice of the people.

Such a structure, with arms only fifty feet high and wide, located in the centre of the garden, in a line with the Commonwealth Avenue, would be an attractive feature in the panorama from any point of view.

It is suggested to use no combustible materials in con-

struction of the structure, and to cover the stone or iron floors and corridors with a carpet made of rubber, cork, and gutta-percha, which is very durable, and known in England, where it is extensively used, as "Kamptulicon" carpet.

DETAILS OF ARRANGEMENT.

Suppose one of the arms of the cross devoted to Natural History, and confided to the care of the Natural History Society—the large dome at the outer end of the gallery would serve for the library and lecture room, and the three smaller dome apartments for its cabinet of specimens. The gallery could be appropriated to the State collection, now so poorly accommodated at the State House. A colonnade twelve or more feet wide around the outside of the arms of the cross, would add to the external effect, and would provide a very suitable place, open to the garden in summer and the gallery in winter, for those very instructive attractions—aquaria on one side, and an aviary for live birds on the other.

A second arm of the cross could be devoted to Agriculture, Horticulture, and Pomology in the same detail, implements of husbandry being placed in the gallery; and the colonnade, arranged in sections, at different temperatures, for experiments in growing tropical plants, etc.

A third—to Historical and Archæological collections for lectures and illustrations in the same detail.

The fourth, to Fine Arts—the colonnades serving for statuary, etc., which, as in the others, arranged with plants and fountains, would serve also as a winter garden.

The Rotunda, to a Polytechnic Institution, like that in London, which should be a place of deposit for approved productions of the useful Arts; and where each evening there could be a series of *short* lectures, practically illustrated, on Commerce—showing by woods, metals, and chemicals, the means, and by models, the mode, of constructing ships; on Manufactures—explaining by samples, drawings, and parts of machines, the various processes from

the raw material to the finished fabric; on Mechanics — practically demonstrating abstract principles, and elucidating the progress of the Art; on Electricity — defining its effect on atmospheres, and on the physical and mental being, as an agent of light, heat, and as a motive power; on Music — combining concert with lecture; on Chemistry — made both amusing and instructive from natural magic to the higher orders or uses of the science as applied to soils, and the domestic wants of man, etc.

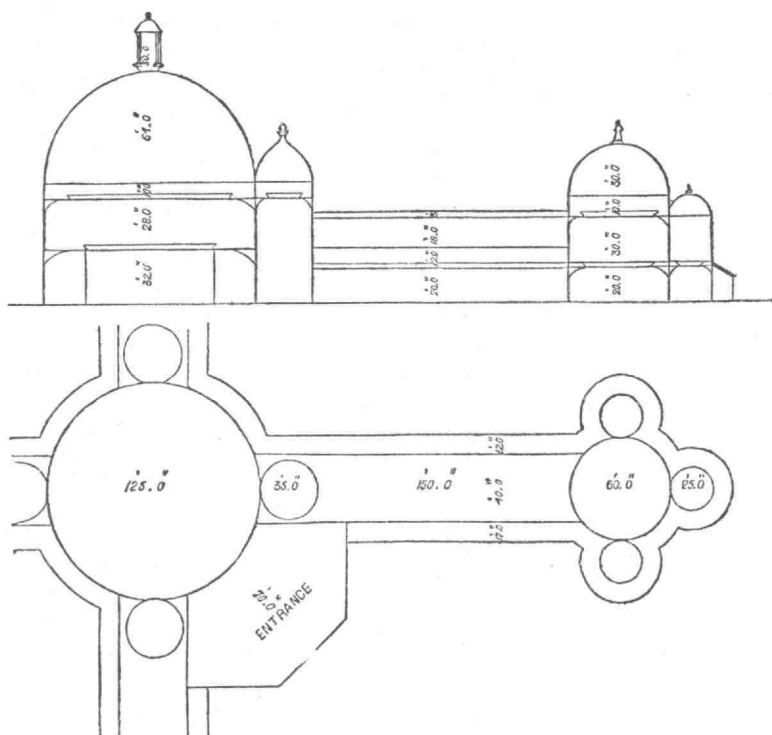
The space between the Fine Art and Historical arms of the cross, could be the garden for Allegorical and Historical Monuments — where could be illustrated the modes of life of our aboriginal race, — for statues of men we love to venerate, etc., — and between the Historical and the Agricultural Galleries on each side of the wide avenue, forming a line with the Commonwealth Avenue, could be the Horticultural Garden — between the Agricultural and Natural History, the Botanico-Zoölogical Garden, and the space between Natural History and Fine Art Galleries devoted to Floriculture.

An apartment in the conservatory, and liberal space in a retired part of the Public Gardens could be devoted to children's play grounds, and provided with the best of the known games in France and on the continent of Europe, as well as such as American ingenuity can suggest for the mental recreation and physical exercise of the young, and consequently of all ages.

GROUND AND SECTION PLAN.

In describing briefly the ground plan and arrangement of the interior of the structure shown on the first page, we would have it clearly understood, that we have chosen figures more to illustrate than for any decision as to the precise dimensions of the various parts of the structure. As before stated, the precise dimensions can be arrived at when it is known how much room will probably be required and the amount of funds that can be readily raised,

though, on this latter point, we doubt not that an institution which meets with such unanimous commendation can command almost any amount of funds necessary for the carrying out, to the fullest extent, the plan for accommodating all approved collections of Art, History, and Science, and the societies and associations owning the same, with ample space for lecture-rooms for the benefit of the people.



While each society would be permitted to have, without any objection, its private apartments for social and such gatherings as it might be desirable to have uninterrupted by the continual ingress of the public. Aside from the benevolence with which Massachusetts men are strongly endowed, there are strong pecuniary motives for the business community to assist liberally in adding to the attractions of the State.

GROUND PLAN.

The diameter of the Rotunda as designated is one hundred and twenty-five feet; that of the four relieving domes, arranged below as ante-chambers to the galleries, thirty-five feet; that of the domes at outer end of the galleries, to be used as library and lecture rooms by the various societies, sixty feet; and of the surrounding domes, twenty-five feet.

The length of the arms of the cross is one hundred and fifty feet; the width forty feet; and of the colonnade twelve feet. The depth of the entrance gallery seventy feet, having liberal space on each side for ticket, cloak, and other rooms. The interstices of the arms of the cross could be arranged corresponding to that shown as entrance gallery, to be used for lecture rooms, etc.

SECTION VIEW.

The height to the first corridor in the Rotunda being thirty-two feet, thence to second gallery twenty-eight feet, to the spring of the arch ten feet, thence to the cupola sixty-four feet, and cupola thirty feet, would make the Rotunda one hundred and sixty-four feet in height.

The height to the first corridor in the domes, for the libraries, etc., of the various societies and associations occupying the Conservatory, being twenty feet, thence to the second gallery thirty feet, to the spring of the arch ten feet, and thence to apex of dome thirty feet, would make these domes ninety feet in height.

The height to the corridor in the arms of the cross being twenty feet, to the spring of the arched roof twelve feet, and thence to the cap or ventilating gallery eighteen feet, would give a sufficient height for the purposes required, and so far from this structure obstructing the view, it would be a pleasant relief for the eye to rest upon, in the panorama of nature.

The arm of the cross devoted to the Fine Arts, could be arranged in two stories — flooring the space between the

corridors — leaving well holes for effect from below, if it were desirable for the better disposition and view of pictures, etc.

All the corridors, stairways, cases for specimens, etc., should be of iron, the floors, as before stated, to be covered with vulcanized India rubber carpet, which would be easy to the feet as well as durable, and which, we are informed, Mr. Goodyear is now manufacturing in this country, at a less price, and of a better quality than the English.

The rest of the paper is filled with extracts from Ruskin and from various books and newspapers, with a half-page of ruled spaces for the entering of subscriptions, and with sundry personal notes from the editor, such as : —

Those receiving this number (which, it will be observed, is a double number,) must not expect to receive it regularly, as we have, in this instance, not only given paper, printing, hired labor, and our own time, but have also had to pre-pay the postage; and as the Journal will not, at the low price we put it at, pay for even paper and printing, unless it has a large circulation, we trust all disposed to favor our plan of establishing a journal to know no sectional interest of north, south, east, or west, but devoted to Science, Art and History, in its purest abstract and practical characteristics, to communicate the abstract of thoughts, essays, discoveries, etc., and, so far as the postage laws permit, distribute samples of the subject matter thereof that may be expressed, written, or explained in the lecture rooms of the Conservatory, to thousands in all sections of the country, will encourage us at the commencement — the time we most need encouragement — and subscribe for such number of copies of the Journal as their interest may suggest.


We regret to record that we have to contend against various petty jealousies. We are quite well aware that those who work the hardest, but too often shake the fruit into

others' hands. We are quite content not to be an exception to this general rule. We begin to feel that this is a selfish world, and that those who cannot clutch hold somewhere for honor, are disposed to use all sorts of instruments to pull up the whole tree. These petty objections incite us on, for no one can work with much zeal until there comes opposition. We would, however, caution the public to look for the "MOTIVE," when any ingenious objections are raised.

Mr. Baker's activity and the magnitude of his plans had not failed to excite the attention of his colleagues of the committee. There ensued a controversy which it is not necessary to investigate further than to publish in facsimile certain advertisements appearing in the *Boston Journal* on the dates of May 7 and May 9.

Boston Journal.

SATURDAY EVENING, MAY 7, 1859.

 **MASSACHUSETTS CONSERVATORY OF ART AND SCIENCE.** At a meeting held May 4, 1859, at the Library of the Boston Society of Natural History, Hon. MARSHALL P. WILDER in the Chair, it was unanimously voted to print this

SPECIAL NOTICE. The Committee who presented the memorial to the last Legislature, asking for a reservation of State Land in the Back Bay for a Conservatory of Art and Science, and who are still engaged in promoting its establishment, find themselves compelled, by the course adopted by Mr. W. E. Baker, a former member of the committee, to publish the following statement:

They wish it to be distinctly understood that Mr. Baker long since ceased to be a member of this committee; and that the publication of the so-called "Conservatory Journal," the leasing of a large building, and the solicitation of specimens to fill it—the plan of a single structure to be located on the Public Garden or elsewhere—and all the steps recently taken by Mr. Baker, by festival or otherwise, to advocate or promote the success of any such scheme as is sketched in the above-mentioned Journal—are prosecuted without the sanction of the committee and wholly on his own responsibility.

Those who wish to know the plan of the committee can obtain the Report, and memorial explaining it, from Dr. S. KNEELAND, Jr., Secretary of the Committee.

(Signed) MARSHALL P. WILDER, Chairman.

GEORGE W. PRATT,

SAM'L H. GOOKING,

ALFRED ORDWAY,

M. D. ROSS.

ALEX. H. RICE,

JAMES M. BEEBE,

EDWARD S. TOBEY,

my 7

WILLIAM B. ROGERS.

S. CABOT, JR.,

AMOS BINNEY,

S. KNEELAND, JR.,

CHARLES L. FLINT,

B. S. ROTCH,

JOHN D. PHILBRICK.

It*

COMMITTEE.

CONSERVATORY OF ART AND

SCIENCE. SPECIAL NOTICE. As it is supposed by some that the Committee appointed in February last to memorialize the Legislature for a reservation of Back Bay Lands, are engaged in establishing the preliminary Conservatory in Summer Street, and that the Conservatory Journal is published under their direction, the undersigned feels himself called upon to join with said Committee, in stating that they are not as a Committee engaged in this mode of aiding the cause. And he is the more desirous of preventing any expression of opinion as to their want of consistency in thus acting, as it may not be generally known that he resigned and withdrew himself of his own free will from that Committee (on March 21st,) that he might not compromise his associates by working in other ways to aid the cause, than the one for which the Committee was specially appointed. He believes he is warranted in stating that the most friendly relations exist between a majority of the gentlemen, members of that Committee, and himself; and he has always endeavored to avoid, and would hesitate taking, any action that would in any way misrepresent them.

The names of the gentlemen acting with him in establishing the preliminary Conservatory, etc., will be found in the Conservatory Journal of May 7th. Those wishing to refer to the memorial of the Committee can obtain it from Dr. S. Kneeland, Jr., Secretary of the Committee, or by calling at the office of the Conservatory Journal, 16 Summer Street, for No. 1 of the Journal, which contains all the memorials and the names of the signers thereof. It* my 7 WM. E. BAKER.

Boston Journal.

MONDAY EVENING. MAY 9. 1859.

MASSACHUSETTS CONSERVATORY OF ART, SCIENCE AND HISTORICAL RELICS.

The notices on this subject so very industriously inserted in the Boston Post, Advertiser, Courier, Atlas and Bee, Journal, Traveller, Ledger, Evening Transcript, and Sunday Press, compels this special notice, and these extracts from the Evening Gazette of Feb. 19, 1859, and other Boston journals:

"A meeting of gentlemen representing the association of Agriculture, Art and Science, and various industrial, educational and moral interests of the city, was held at 3¼ P. M., on Feb. 18, at the Library of the Boston Society of Natural History. The meeting was organized by the choice of Hon. MARSHALL P. WILDER as Chairman, and Dr. S. KNEELAND, Jr., as Secretary.

The Chairman stated that the object of the meeting was to take steps for memorializing the present Legislature for a grant of land belonging to the Commonwealth, in aid of a plan for a conservatory of art and science, and he invited the representatives of the different interests to state their views.

After some general remarks by various persons, Mr. W. E. BAKER moved that a committee of three be appointed to prepare a memorial to the Legislature in favor of reservation of a sufficient space of the Commonwealth land for the contemplated Conservatory of Art, Science and Historical Relics. This motion was adopted. The following gentlemen were chosen by nomination: Messrs. EDMANDS, ROSS and BAKER.

On motion of Mr. BAKER, four other gentlemen were added to the Committee, viz: Messrs. M. P. WILDER, GEORGE W. PRATT, SAMUEL H. GOOKIN and A. ORDWAY.

Adjourned to meet at such time and place as the committee may select.

DR. S. KNEELAND, JR., Sec'y.

SECOND EXTRACT.

(From Report published in various Journals.)

At a second meeting of gentlemen interested in the proposed Conservatory of Art and Science, the Committee appointed at the first meeting made a report of their doings since Feb 18.

On motion of Wm. E. Baker, eight gentlemen were added to the original Committee of seven—making the Committee consist of Hon. Marshall P. Wilder, George W. Pratt, Sam'l H. Gookin, Alfred Ordway, Wm. E. Baker, B. F. Edmands, M. D. Ross, E. S. Tobey, James M. Beebe, B. S. Rotch, Dr. S. Cabot, Jr., Amos Binney, Dr. S. Kneeland, Jr., Charles L. Flint, and J. D. Philbrick.

(Signed) DR. S. KNEELAND, JR., Sec'y.

Finding a difficulty in getting the members of the Committee together as often as the undersigned had suggestions to offer, and being unfortunate in never having his suggestions approved of by a certain two or three of the Committee—and being settled in opinion that the land which the State might reserve should be for one commodious structure, with liberty for many societies, and not as a site for such societies as had means to erect, to the exclusion of the equally deserving societies *without* means, as was advocated by several—the undersigned tendered the following letter of resignation:

18 SUMMER STREET, March 21, 1859.

To Gentlemen, members of a committee appointed at a meeting of citizens to prepare a memorial praying the two branches of the Massachusetts Legislature to reserve a part of the Back Bay Land for the use of societies and associations devoted to Agriculture, Horticulture, Natural History, Art and Science—the writer would respectfully address, informing that in the month of January last I submitted to the Boston Society of Natural History, the Historic-Genealogical Society, the Massachusetts Society for promoting Agriculture, the Boston Board of Trade, and various other societies and associations, a plan, (the plan referred to can be had by applying to the Conservatory Journal office) for establishing a Massachusetts Conservatory of Art, Science and Historical Relics; that the Boston Society of Natural History and the New England Historic-Genealogical Society appointed a committee to confer on the plan. The result of various deliberations was a favorable report to each society on the general part, that is, obtaining a reservation of land. And the consequent meetings and hearings before the Legislative Committee on Back Bay Lands appears to be the progress of the proceedings thus far. Pending which I was disposed to take some measures to agitate the whole State upon the subject by various memorials signed by various interests and classes of society, and also one signed by the ladies, and finding I was not obtaining the full approval of the Committee, although they endorsed my work when it had so far progressed that they could not well help it—I did, as you well know, hand in my resignation as a member of that Committee on Friday, the 18th inst., which, after two hours or more debate, you thought proper to do me the honor to refuse, and at the request of various members, as the hour was late, I consented to withdraw my resignation, in order to give all, as well as myself, time for consideration. Therefore, having fully considered the matter, and not being willing to compromise any of the gentlemen on the Committee—whom I much esteem and consider it an honor to be associated with—by any act which, as a representative of scientific societies, I could not approve, yet, being disposed to aid the working out to the fullest extent the plans I have had in my mind for two years, to interest the masses, I do hereby formally tender my resignation, and wish to be no longer one of the Committee.

Very respectfully tendered,

WILLIAM E. BAKER.

It is probable that these facts will be read for the first time by several members of the committee, as Messrs. Rogers and Rice have been absent from the city, and have but recently been added to the committee (since the resignation of the undersigned) and Mr. Beebe only consented to permit his name to be used at the earnest solicitation of M. D. Ross, with the special understanding that he was not to be called upon for service, or to attend meetings.

The undersigned supposed his motion limited the power of the Committee to the single act of applying to the State for reservation of Back Bay Land for the general purposes indicated; and having received an impression some time previous to the report of the Legislative Committee appointed to consider this memorial, that the report would be favorable, yet that action would be deferred until the Back Bay Land—Public Garden bill—was disposed of, he thought it best to withdraw from the Committee, and regrets that his since employing his mental, physical and pecuniary resources in aid of establishing a Conservatory of art and science should be displeasing to them. Believing he is warranted in stating that the kindest relations exist between a majority of the gentlemen members and himself, the undersigned regrets he is compelled to place himself so conspicuously before the public.

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WILLIAM E. BAKER.

The result of this published controversy seems to have been the abandonment of the "Festival" and the miniature "Conservatory" on Summer Street; for in No. 5 of the *Journal* was published the following editorial:—

CONCENTRATION IS STRENGTH.

We cannot but be gratified at the very general commendation of the plan of the structure proposed for the Conservatory of Art, Science, and Historical Relics.

The plan of locating it on the Public Garden, also meets with favor. To test the wish of the people, petitions were placed at the polls, at the voting on the amendment of the Constitution, May 9th, and nearly *two thousand* of the prominent men of all classes of society signed in favor of locating it on the *Public Garden*.

This expression of the wishes of the people, with that before had, makes the establishment of a preliminary Conservatory in Summer Street unnecessary, and we believe we can more effectually aid the cause by accepting the proposition of several Manufacturing Companies, desiring to lease the building designed for this purpose, and defer that which now would be but a temporary exhibition, to some future time.

When we entered upon this subject of a Conservatory of Art and Science, the object seemed so clearly to recommend itself to public approval, that we expected an unanimity of sentiment among the various Historical and Scientific Associations, which has not been realized. The general opinion in favor of a Conservatory, as expressed by the people, is conclusive; but differences of opinion as to the details of its establishment, and the necessity of an unanimity in regard to it, together with the fact that nothing towards a Building can be done at present, until the grade of the Public Garden is raised, or a part of the Back Bay filled in, renders it, in the opinion of judicious friends, *unnecessary*. We, therefore, decide to concentrate

our efforts toward the accomplishment of the main purpose we have in view; and, believing the Conservatory Journal to be one of the most powerful agencies to keep the subject fresh in the minds of the people of Massachusetts, and to effect, through the Legislature of the State, what is so much desired by the people, we shall spare no efforts to render the claims of this great movement of paramount importance to every lover of his race. Confident in the sustaining will of the citizens, we relinquish the idea of establishing a nucleus of a Conservatory at this time, that we may, by so doing, devote the time, labor, and personal attention which would be necessary to carry on such an exhibition, to other measures in aid of the cause, and to the Conservatory Journal, which we have good reason for believing will tend to harmonize and unite public sentiment in such a manner, as will result in the erection of such a Conservatory on the Public Garden or Back Bay, which will be an honor to the City of Boston as the metropolis of New England. For this purpose, the columns of this Journal will be open to all who may desire to contribute, providing articles intended for insertion are terse, pertinent, and otherwise adapted to its columns.

Also a notice relative to the future plans of the paper:—

CONSERVATORY JOURNAL.

NOTICE.

The following are some of the elements by which we hope to make the "CONSERVATORY" a first-class Journal of Art, Science, and Literature:

1. A foreign correspondence, furnishing, say, a weekly compendium of Literary, Scientific, and Artistic information, from London and Paris; embracing the proceedings and transactions of the various societies and associations; intelligence of all the literary and artistic movements and topics of the day; a report of the current conversations and "chit-chat" among literary and scientific circles; also notices of New Publications.

2. A consecutive transmission of the best London and Parisian artistic, literary, and scientific journals; also, regular exchanges of the best American artistic and literary journals and reviews.

3. The publication of suitable extracts from authors whose style is lucid and popular,—the extracts to treat of all subjects pertaining to art, science, and literature.

4. A leader of one column or more, and original articles from the pens of our best writers.

5. Notices of exhibitions in Boston and elsewhere, etc., etc.

By these means the "CONSERVATORY JOURNAL" will be enabled to publish the best *original* information upon its leading subjects; thus giving it a distinguishing feature, and a value which we hope will commend it to public patronage.

The Journal will be issued every other Saturday, of folio size, with a few of its columns devoted to advertisements. We have fixed the subscription at \$1.00 per an., or 4 cents a single number. We cannot, at this price, calculate beyond a simple return of our outlay, which, considering the scale upon which the Journal will be conducted, and the expenses of procuring the best information from the European capitals, will necessarily be large.

The "CONSERVATORY JOURNAL" is to be devoted to the cause in aid of which it was originally established, and will, therefore, be published without reference to profit.

Advertisers can obtain circulars containing information of its circulation throughout the United States, in Great Britain, and on the continent of Europe.

Despite the determination voiced in this "Notice," and even with the aid of paid advertisements, which for the first time, appeared in No. 6 of the *Journal*, the opposition of those who believed Mr. Baker's methods unwise and the insufficiency of support from those who thought them wise, put an end to this elaborate undertaking. Like many a

predecessor and successor in the field of journalism, the *Conservatory Journal*, after the issue of June 18, 1859 appears never to have come forth again.

It is not for a later generation to pass judgment upon the enterprise. Most of the great objects for which it stood, and for which its "Editor, proprietor and publisher" worked with such zeal and generosity, have been accomplished in far greater measure and perfection than he could have possibly foreseen. It is no more than just to believe that this *Conservatory Journal*, in its short and checkered life, contributed its part toward building up that public opinion without the support of which an enterprise of such magnitude as this can never be established.

Filially uncritical of this pioneer in the field of Institute journalism, the REVIEW does but a simple duty in paying homage at this almost forgotten grave.

TECHNICAL EDUCATION AND STUDENT
LIFE IN FRANCE *

Gentlemen,— It is my pleasant duty at the beginning of this *séance* to thank your eminent President, Dr. Pritchett, for the honor he has conferred in permitting me to address one of the glories of America, the Massachusetts Institute of Technology.

Your President has remembered that among my professional titles the one of which I am most proud is that of Professor at the Conservatory of Arts and Trades, the institution which fulfils in Paris certain of the functions united in your great school. It is therefore as a colleague that he has welcomed me ; and, in the same spirit, it is as a *confrère* that I have been greeted by your masters whom I have met. Nothing could touch me more ; and for this reason I willingly sacrifice my maternal tongue, in order that there may be a community of spirit with all of you in this conference.

I am to introduce you to the studies and the life of your comrades in France. And, if you will consider me as their delegate, I will begin by offering you their sympathetic and fraternal greeting.

Public instruction in France has preserved the traces of a long historic evolution which show successively the diverse mediums of which it is composed. Thus, instead of being concentrated in a vast university comprising all forms of human knowledge, our higher education is distributed, in Paris, among at least a dozen establishments, each one of which retains the distinctive mark, the character, and the special aim of its origin. Besides the five faculties (letters, science, law, medicine, and theology, two of which only, the two first, are reunited at the Sorbonne), there is the College of France, *l'École des Hautes Études*, the School of Charts,

* An address to the students of the Massachusetts Institute of Technology, Feb. 24, 1902.

the Upper Normal School, the Museum of Natural History, the Conservatory of Arts and Trades, the School of Fine Arts, the School of the Louvre, the School of Architecture, the Polytechnic School, *l'École Centrale*, the School of Mines, the School of Road and Bridge Construction, and even others, each of which represents a portion of the higher education and is operated separately, whereas in America all would be united in a single university.

This principle of the division of work and of a multiplicity of mediums is applied in France to all branches of education, and particularly to the technical instruction of which I am to speak to you to-day. You must not expect to find there a vast synthetic establishment, in which all forms of industrial art are represented, but a hierarchy of special schools, each of which has its characteristic object and its particular methods. I will not permit myself to decide which is the better method, yours or ours; but I wish to inform you in the beginning of this essential difference between the educational systems of the two peoples.

The lower or primary degree of our technological instruction is represented by *Écoles Nationales des Arts et Métiers*. They are four in number, and have been established within a century. The present school at Chalons (which was first located at Compiègne, and which has served as a model for the others) was founded in the year XI. of the Republic,—that is to say, in 1803; that of Angers (at first at Beauprean) was founded in 1804; that of Aix, in 1843; and that of Lille, in 1881.

The geographical position of these four cities, situated in the East, the West, the South, and the North, has given the four schools a local character which repeats itself in the students. Each establishment receives only young men of the region; and, notwithstanding the uniformity of the programmes and the general studies, notwithstanding the unity of direction, each one exhibits a particular physiognomy from the type of its students, from the nature of its predominating trades, from the particular traditions which, little by little, established it in this very *milieu*.

A student of Aix is immediately recognized by his happy-go-lucky appearance, his coat thrown open, and his loose, floating cravat; he has the air of an amateur artist, giving rather the impression of a young designer of inventions than that of an industrial overseer. At Lille, on the contrary, it is the manner of a superior workman which dominates. The thoughtful face and the modest and careworn manner suggest a foreman of mines. At Chalons one divines the machinist or the railroad man; and at Angers, the manager of bridges and causeways, the civil functionary occupied with transportation.

The aim of these four institutions, following the organic decree, is "to form workmen capable of becoming heads of the workshop and manufacturers versed in the mechanic arts." That is to say, the State, in creating these schools, has had in view the employer as much as the employee. And, indeed, many of the employees in our small manufactories have been educated in them, so that they have the same culture, the same traditions as their foremen. This community of origin is an excellent guarantee of mutual understanding.

The studies cover a period of three years, and the diploma: "*Ancien élève breveté des Écoles Nationales d'Arts et Métiers de France*" is given, at the conclusion, to such students as have obtained, in the examinations, marks averaging at least eleven out of twenty. The first fifteen graduates (there are three hundred in each school) receive, after staying a year in an industrial house or a workshop, a subsidy of 500 francs to aid in their support.

Entrance to the schools is rigorously confined to applicants between the ages of fifteen and seventeen years; and the system of recruiting is by competition, the first three hundred only out of the six hundred or seven hundred presenting themselves in each region being admitted. Moreover, each candidate must procure in advance a certificate of general preparation corresponding to the programme of your high schools.

Aside from the pure mathematics so necessary to the

workman,— algebra, trigonometry, analytical and descriptive geometry, the instruction comprises complete courses in mechanics, physics, electricity, chemistry, and drawing. Four workshops are open to students, who may choose among them, but who must spend some time in each. These are: (1) Carpentry and wood-carving; (2) Foundry-work; (3) Forging; (4) Fitting.

The regime is that of the *internat*,—I might even add, that of the barrack. For the School of Arts and Trades is governed by a military system. Whether right or wrong, we believe, in France, that the critical age of the young man, from fifteen to eighteen years, should be watched over and conducted paternally. It is the moment of great effort necessary to conquer a place in the world. It is also the age when curiosity, the passions, the impulses, are awakened; and society, represented by the State, leans toward the adolescent in order to assist and guide him in his formation.

Therefore, a very special régime, which, I fear, will seem strange to you young Americans. Not only is the student submitted to the discipline of rules in the school itself, but in the hours set aside for recreation his liberty is disposed of and influenced by habits and traditions which would weigh upon your spirit of individualism. He is not allowed personal money, but only his share in a sort of common fund called *masse*. He is considered as one of a large family, which supervises all his needs and interdicts him from considering his selfish interests.

The solidarity among the students is such that, if a fault is committed by some one unknown, it is the *chef de chambrée*, the chief of the mess (that is to say, the first of the group by work and by merit), who is responsible for the misdeed and who will pay for the culprit. Moreover, the culprit is morally obliged to denounce himself.

There results from this organization a spirit of *camaraderie* of which no idea can be formed by one who has not passed through the *internat*. A frankness also, a habit of living in broad daylight, a horror of hypocrisy, is the distinctive trait of our young men.

Living thus with others, one cannot conceal his defects, and does not even attempt to do so. The tendency also toward ferocious egotism, born with the child, is insensibly lost. He yields to the needs and exigencies of others: he becomes considerate, respectful of his neighbors' rights, polite, disinterested. Fraternity here, as in all circumstances, involves an amelioration of individuals, a progress in morality.

The entrance to the National School of Arts and Trades is within the reach of small purses. The price of board and outfit is 1,000 francs per year, everything included; and a scholarship or half-scholarship is granted to poor students of merit. This institution, which permits a child of the people to raise his condition, has certainly been a powerful agent of social progress in our France in the century which has rolled away.

The middle or secondary degree of technical teaching is represented in France by two establishments very different in aspect and constitution, but tending toward the same end, that of preparing the engineer for all the needs of industrial life. The first is "*l'École Centrale des Arts et Métiers*," founded in 1829 by private initiative in the *hôtel de Juigne*, in the quarter of Paris called the *Marais*, and installed since 1890 in the vast buildings which proclaim its extension and its adoption by the State.

The service common to all parts of the school is concentrated upon the ground floor. The refectory, physical and chemical laboratories, are also on this floor. Above are three stories, each of which is devoted to one of three grades (the period of study covers three years). Each story includes twenty rooms for study, accommodating a dozen students. Above all is the library and what is called the *port-folio*; that is to say, the collection of plans, works, *épures*, and drawings made at the school and judged worthy to be preserved.

The organization of *l'École Centrale* is analogous to that of the *Polytechnicum* of Dresden and *l'École Polytechnique* of Zürich. The students are *externes*, the administration not

being responsible for their conduct, save for the time passed at the school. Indeed, the students are already formed; and the very care bestowed during the critical period of adolescence serves as a guarantee that henceforth they are proud of their liberty, for which they have now sufficient intelligence.

The only control assumed by the school, its sole intervention in the work of the students, consists in the examinations. They have only to be present at the *concours*. The entrance examination does not, however, assure them of a happy issue of their studies, as but 250 per year are chosen out of 1,200 competitors. Repeated trials every three months, which result in the keeping or the discharge of the student, demand continual effort. To obtain the diploma of civil engineer at the end of the third year, it is necessary to have obtained an average of $13\frac{1}{2}$ points out of 20. It is consequently the development of the responsible life succeeding the life which has been guarded. The young man is considered as capable of a knowledge of what is necessary, and he is made master of his destiny. Thus you see that our instruction is not illiberal, as is sometimes asserted. Liberty and confidence is in proportion to the age of the student, with the proofs which he has already given of his intelligence and his love of work. He is freed from the moment he is able to profit by his independence and to feel himself sufficiently strong not to abuse it.

The first year is given up to general study, above all to the higher mathematics necessary to the engineer; the two following years, to industrial applications of science.

There are four specialties: (1) Construction, (2) Chemistry, (3) Mechanics, (4) Metallurgy. Each day comprises two parts: the first, from half-past eight in the morning to eleven o'clock; the second, from half-past eleven to one.

Instruction here is naturally dearer than in the School of Arts and Trades, because young men instead of lads are in question and laboratory expenses are high. 1,000 francs is required for the simple tuition.

I have said that the regime of *externat* gives the most

absolute liberty to the student outside the class. It must not be thought, however, that the life of the school is limited to a mingling of the young men only during certain hours of the day. On the contrary, *camaraderie* is extremely developed in this establishment, whose traditions and customs are altogether special. There is, too, a special *argot*, peculiar to *l'École Centrale*, and a little innocent freemasonry by which they recognize each other, the usage of which persists with the graduates for a long time after leaving the school. The device of the house, borrowed from chemical nomenclature, constitutes a pun, the remembrance of which, like a counsel bestowed by the school, is lifelong: *S. K. O. (Soufre et Potasse)*,—that is to say, *souffre et travaille dur* (the slang sense of the verb *potasser*).

At the school itself are *salles d'étude*, where until six in the afternoon the students pass all the time unoccupied by recitations. Thus they work in common,—a powerful aid to the weak and a source of emulation to the strong. This semi-community of life is continued in the restaurant or canteen where the students lunch. The character of this establishment is sensibly analogous to the refectories of your universities, with the difference that they are permitted wine or beer. Here dare I remark, this infraction of what you regard as ordinary sobriety does not appear to me very dangerous. We consider in France that the moderate use of hygienic drinks (wine, beer, and cider) is injurious only in their abuse, and experience has never shown that we are wrong. There is no example of a well-bred young man, accustomed from his youth to drink one or two glasses of wine with his meals, becoming a drunkard. As much cannot be said of young Englishmen trained to enforced sobriety. These, when occasion permits, seize the drink with avidity, regarding it not as a liquid food, but as a source of brutal excitement, an *extra* of whose temperate use they are incapable. Finally, it is perhaps to the regular and measured use of wine that we owe the vivacity which characterizes our race and to which the fecundity investing the works of the imagination is due. Never in France has

it entered the mind of any one to forbid the use of wine in the schools, and it is not *l'École Centrale* which will authorize the innovation.

The only uniform of the student of *l'École Centrale* is a cap trimmed with gold braid, with a bee in the middle of the visor, to indicate that life is made up of work, production, and order.

At the school, however, fantastic costumes are the rule. It is the fashion for the students to wear white blouses painted with all sorts of attributes indicative of their profession; and once a year, on the day of *Monôme*, that of the final competition, the Parisians see defile a sort of long *farandole* in the emblematic costumes of the *atelier* on the way to pay comic and joyous homage to the statues of the great men who have honored the profession of engineer.

L'École Polytechnique, also recruited by competition, was, at the time of its foundation under the French Revolution, an establishment of the same description as *l'École Centrale*; that is to say, destined to form engineers, civil as well as military. The original idea was the unity of science and art, whether it was a question of the works of war or of peace. Or, rather, the men of the Revolution believed that war is exceptional, a crisis in the life of nations, and that it is needless to organize all sorts of institutions especially for that purpose. Facts, however, soon showed they were wrong; and *l'École Polytechnique* was conducted more and more to prepare artillery and military engineers. But the fundamental intention of the institution remained, represented by assigning to the civil service the first graduates of each promotion. These become engineers of mines, bridges, and roads, and, as I will explain presently, even enter into the administration of finance and of manufactures which demand scientific knowledge. The others apply to the *armes savantes* the special knowledge acquired at the school. They become engineers, but engineers in the service of the army, constructing forts, barracks, and bridges, repairing guns and cannon, and directing the service relating to this branch of military art.

The unity of origin of the State civil engineers and of the officers of the military corps of engineers and of artillery, in a country where love of special studies is carried to extremes, has been sometimes criticised. In reality, it is an excellent condition, envied by many other nations.

As the engineers graduated from *l'École Polytechnique* become, for the most part, military men, it has a military organization, in which are found all the advantages as well as the disadvantages of barrack life. The work is very arduous, too much so even, when the health and the sight of our young officers and military engineers are considered. Almost all of these young men are obliged to wear glasses. The programmes of the school are overloaded with higher mathematics, which perhaps are no longer very useful, and the habit of which imparts to the graduates a certain tendency to become mere theorists, dealing with Utopian abstractions. Again, the *polytechnique* spirit has not always been favorable to the development of our industries. It is too speculative, not sufficiently practical, too much given to subtleties of mechanics and calculation, and not fond enough of useful applications and necessary economies.

For this very reason it has also an aristocratic tendency, which has often been a subject of mockery in France. The Polytechnicians have always a certain contempt for the plain people who, unlike themselves, have not devoted years to the study of the infinitesimal calculus, the definition of rare curves, or to success in a *tour de force* of technical execution. And as solidarity is greatly developed among them, as they support and assist one another in all circumstances of life for the simple reason of their community of origin, these dear comrades (as they call each other, whatever the difference in their situation) are often the subjects at once of mockery and envy in our democracy, where they represent an *élite* somewhat too conscious of its superiority and jealously asserting it.

This is, however, only a slight cloud on their resplendent sun. There is no school in France more honored, more

popular than *l'École Polytechnique*. The very quiet uniform (black and gold) is sufficient to command the respect of the passerby; and at the yearly parade, the 14th of July, when the army is reviewed at the Bois de Boulogne, the crowd greets with long acclamation the "First Battalion of France."

We have now arrived at the third degree of technical education, the higher degree. It is represented by two great special schools, the School of Mines and *l'École des Ponts et Chaussées*, and by an institution entirely distinct which corresponds to the highest point of applied scientific culture, the National Conservatory of Arts and Trades.

The School of Mines was established even before that of Arts and Trades. It goes back to the old monarchy, to the year 1764. After changing its site and by-laws several times, it reached its full development in 1888; and rules considered final have recently been laid down for it. It fulfils two purposes. The first is to prepare engineers (who have graduated among the first from *l'École Polytechnique*) for entrance into the National Corps of Mining Engineers. As you know, with us the ground beneath the surface belongs to the State, which grants to private concerns the utilization of the wealth there contained. But this granting is made subject to certain conditions which imply the constant presence of an official representing the State.

But to require an important and powerful institute such as this to educate merely four or five engineers a year would be a great waste of effort. The school has, therefore, a further purpose of educating young men not coming from *l'École Polytechnique*, who are aspiring to the civil title; that is to say, private mining engineers. As the standard which must be reached in order to obtain this degree is very high, and there is no school in Paris able to fit candidates, the School of Mines has been led to institute courses preparatory to its regular courses. These courses are taken by young men who have already been winnowed by a competitive examination, and who must not be more than twenty-five years old. The course of instruction lasts one year, after which the students begin the strictly tech-

nical subjects of the school, overtaking the graduates of the *École Polytechnique* and working with them for two years more. Finally, all examinations having been passed, they are proclaimed Civil Mining Engineers,—that is, engineers fitted to be employed in private undertakings, where they will be controlled by their fellow-students of the National Corps of Mining Engineers; for graduates of the Polytechnic School alone enter this corps. The School of Mines includes twenty-three different courses, not to mention five preparatory courses leading up to them. It spreads before its students wonderful palæontological, mineralogical, geological, metallurgical collections, collections of mechanical models, a laboratory for tests, and, what is worth still more, a wealth of tradition and experience of the highest grade. It is one of the institutions which does most honor to contemporary France.

The *École des Ponts et Chaussées* is established on exactly the same plan as the School of Mines. This school also receives two kinds of students; first, future State engineers, graduates of the *École Polytechnique*, who are to enter the National Corps of Bridges and Highways. There it will be their duty to lay out roads, build for the State bridges, railroads, canals, and machinery, and to oversee all sorts of construction which come under the province of public works, trade and manufacturers, agriculture, posts and telegraph, irrigation, telegraphy, general sanitary arrangements, etc.

The *École des Ponts et Chaussées* receives, furthermore, young men of quite a different past, who enter into the preparatory course through competitive examinations. The latter intend to devote themselves to similar work, not in the service of the State (which only employs graduates of the *École Polytechnique*), but in the service of private firms of cities and counties.

The course of study lasts three years; and the school, besides its home laboratories, has at its service vast workshops in the Trocadéro, where building materials are subjected to tests. It goes without saying that the students,

like those in the School of Mines, are absolutely uncontrolled, and are only obliged to attend lectures and to pass successfully ever-recurring examinations. Strictly speaking, they are no longer at school; they are men, young engineers who wish to bring their art to the highest possible perfection, in order that they may rank among its foremost exponents.

Finally, the *Conservatoire National des Arts et Métiers* is a sort of superior institute where any one, whatever his previous culture, may acquire exact information in the most important branches of science and art applied to industries. This supplementary education, open to all, but which can only really be acquired by minds already trained and cultivated, may be taken in two ways:—

(a) First, by taking advantage of the most complete and most varied collection in the world of machinery and instruments which are used in pure or applied science. This collection, begun in the seventeenth century, has been increased by the gifts of all the great scientists of the eighteenth century, as well as by the law requiring every French inventor to deposit in the museum of the institute the original model of his invention, or at least the plan which sets it forth. The collection fills extended galleries several hundred metres long, which have been devoted to this purpose in the former Abbey of St. Martin. It includes extremely interesting historical specimens and the main series of forms which express the evolution of the more important industrial discoveries. This museum is much resorted to. Workingmen with their families visit it on Sundays, when the weather forbids an excursion into the country, and give or ask for explanations, which show how much they are interested.

(b) The second means of education given by the institute is a system of instruction unique in Paris and, as far as I know, in the world. This instruction is both philosophical and popular, under the auspices of the State and yet independent; and it attracts many people from many lands and stations. It would hardly become me to say that this teaching is intrusted to the ablest men, since the writer has

the honor of lecturing there on social economics; but it may at least be stated that most of the professors are practical scientific men, chosen from among the most expert specialists in their respective subjects. Thus we see that the free spirit of democracy, which appears in the first stage of our technical education, reappears in the highest stage, in spite of the fact that a rather aristocratic spirit pervades the intermediary region. It is from the common people that those foremen are drawn which form, as it were, the backbone of our industrial army. The same common people are summoned to come and enjoy the final outcome of this education elaborated by our foremost scientists. It is one more instance in which the plain people and men of the highest culture have joined hands in a common object, and so helped to strengthen the extraordinary unity of French civilization.

Do I need to draw the inference which follows from the facts set before you? You see it as well as I do. The details given prove that technical training is one of the most living and successful branches of our national education. It forms men who are not merely skilled workmen, but manly men, who, thanks to the simple, active, painstaking life they lead, acquire a frankness, a straightforwardness, an initiative, which makes of them ideal citizens.

LEOPOLD MABILLEAU.

WHAT IS TRUTH?

AN ADDRESS TO COLLEGE STUDENTS*

I welcome these meetings where, as members of a brotherhood, we discuss frankly some of the larger philosophical ideas which interest the whole world. And this not simply for the reason that they bring me into a face-to-face relation with you, but also because these discussions serve to remind us that the college life is a part of the life of the world, and not a life isolated from it.

Last year I called your attention to this thought in speaking to you concerning the relations of a citizen of a free State to the government. At that time we had some discussion of the methods which the government employs to conduct its business, of the precautions which it adopts to secure honesty and efficiency in its officers and employees, and of the opportunity which the government service of our own country offers to educated men.

To-day I wish to speak to you concerning the relations of citizens to each other and concerning the guiding principle which ought to govern men, in order that these relations may be the best, not only for the individual, but for the State as well. And in the outset I remind you again that the college education, if it be really an education, ought to count in preparation for life, and that the college and the life you lead in it is a part of your life in the world.

You will find, both in college and in that later life of which it is the beginning, that with larger opportunity and larger acquaintance you will be called upon to deal in greater and greater measure with questions which concern your social, political, and moral relations with other men.

In what way, may I ask, does your education in applied science help to the adjustment of these relations, and is

* One of a series of talks before the Sophomore Class of the Institute of Technology. Reprinted, by permission, and with slight additions, from the *Outlook* of March 8, 1902.

there in the study of science that which serves to fix a guiding principle of life and of conduct?

I believe that there is such a principle to be found in the studies which you pursue. I go even further and say frankly that, if your scientific studies furnish you no suggestions in these matters, if your education here does not connect itself with any philosophy of life and of conduct, if it has not strengthened your moral purpose and helped also to clear your conception of truth and of duty, then you have caught only the husks of science, the grain has slipped through your fingers; you have acquired, not education, but training.

But in what way does the scientific education minister to the right interpretation of our duties in the social order in which we find ourselves?

Let us consider for a moment how the society which we know has come to exist, and how the characteristics of the individuals who compose it, have been formed. For although, as Marcus Aurelius says, man is a social animal, nevertheless he became such only after a long and painful history, and he brought into the social order, as it came to exist, characteristics developed by ages of experience under different conditions.

Our knowledge of primitive man goes back to a period, far distant, when he was a solitary animal; when he fought day by day with other men and with the beasts of the field for right to live. As time went on, men became gregarious, the family was merged into the tribe and the tribe into the nation, until, in the fulness of this twentieth century, all civilized mankind are bound together by ties of common interest and of common sympathy.

Primitive man lived in complete freedom. He concerned himself with no thought of others. He recognized no responsibility for others. But, as society was slowly established, the individual accepted certain limitations of his freedom for the sake of the common good. He assumed certain responsibilities which the social order entailed. As time went on the relations became more complex, and the

lines of influence between man and man were enormously multiplied. Primitive man could be influenced at most by the one or two fellow-savages whom he met in his solitary wandering. The man who may bring the strongest influence into your life, or my life, may come from the other side of the world. Modern life has become exceedingly complex. No man lives to himself. He may influence in one way or another the lives of a thousand men.

Now, in a society so constituted, made up of human beings who still retain the desire of individual liberty, in whom the long struggle for existence has implanted in each breast the passion to do the best for himself, how may the social order be maintained and individual freedom and individual efficiency be preserved? And in what way does a study of science minister to the maintenance of these relations?

My answer to this question is this: The scientific method of study is characterized rather by a distinctive attitude of mind to truth than by any new machinery for collecting facts. The scientific method insists that the student approach a problem with open mind, that he accept the facts as they really exist, that he be satisfied with no half-way solution, and that, having found the truth, he follow it wherever it leads.

In my opinion, the course which at once conserves the social order and the individual freedom is to be found in a knowledge of the truth by the individual citizen. And this knowledge of the truth in our social relations is to be had by use of the same method which we employ in seeking for scientific truth. I believe that the value of the citizen is measured by his ability to know the truth and to use it, and that his freedom is limited by this same ability. I am convinced that the process by which we acquire this ability is the same whether the truth we seek refer to questions of science or to questions of morals. Science says to those who love her, Know truth and follow it. In so doing you serve best your fellow-men and yourself.

But I can understand the questions which such state-

ments immediately raise in your minds. In science, you say, one can know the truth. In the chemical or in the physical laboratory one can compare theory with exact tests, and know whether his results be true or not; but one has no such criterion for judgment in social and moral questions. How is one to know the truth in such matters in order that he may follow it?

In the days of the Roman emperors the procurator of a certain conquered province in Asia Minor found before him two parties, each of whom claimed to represent the truth. On the one side were the religious leaders of the province, earnest, narrow, confident that they were the divinely appointed guardians of truth. On the other side stood one accused by them of impiety, unbelief, and disregard of the law. But when the accused spoke, his plea for truth was so noble and so earnest that it aroused the attention of even the careless and reckless procurator; and, as he looked in bewilderment from one to the other, he asked, half helplessly, What is truth?

I can well imagine that many of you, coming as you do from distant homes to a strange city, taking up as you must new duties amid new surroundings, find yourself constantly in the presence of new conceptions of duty concerning these matters of every-day life. Some of the things which you have been taught to look upon as wrong you find done by those in whom you have confidence. Some of the things which you do are not in accord with the views of your companions. And as you observe this difference of opinion concerning those things which men consider right in their relations with other men, I can well imagine you must now and then ask yourself the question, What is truth?

Now, I do not pretend to be able to tell you where truth is. Perhaps my position is somewhat like that of the small Swiss whom I met on top of the Gemmi Pass, and of whom I asked the question, "Where is Kandersteg?" "I don't know," said he, "but there is the road to it." And although each of us finds truth for himself, if he find it at all, nevertheless I may be able to point out some things

which will mark the way to it, whether you take one path or another.

In order that a man may reach truth, and having reached it make it effective, at least two qualities are necessary. One is what we call moral sense, earnestness of purpose, desire to do that which is true. The other is intellectual clearness, the ability to think. And the result which a man accomplishes is in large measure a function not of one but of both of these qualities.

You have in mechanics a formula for the momentum of a moving body. This momentum depends both upon the mass of the body and upon its velocity, and is equal to the product of the mass by the velocity. The momentum of a man in the social order in respect to truth is represented by a similar formula. His efficiency equals the moral purpose multiplied into the ability to think straight.

The world's history is full of the story of men who had one of these qualities and who failed by lack of the other. It is difficult to say which has done the greater harm — blind devotion which would not see, or intelligence which saw, but lacked purpose and moral courage. Each has at one time or another filled the world with crime and suffering.

The scene to which I have just referred furnishes an illustration of both these cases. The Jewish priests who clamored for the death of the Nazarene were no doubt earnest in their belief that they represented truth, but they lacked the clearness of vision to recognize what truth was. Tradition outweighed with them intelligence. Pilate, on the other hand, educated as a Roman knight, a man who knew the world, intellectually alert, saw clearly that this man who stood before him was no criminal, that his words had extraordinary depth and significance. In a weak way he sought to turn aside the judgment of the priests, but his lack of moral purpose made this effort fruitless in the face of the earnestness of the scribes and the Pharisees.

And so, although no man can point out to you the way of truth, although that path is one which each one of you

must find by his own effort, to walk in this path you will require not only moral earnestness, but intellectual clearness. One must not only feel right, but he must think straight; he must have not only sentiment, but sense.

But you will say that even those who unite moral purpose with intellectual alertness, those who appeal both to conscience and to intellect, even those men do not agree in their attitude concerning what is true in moral and in social questions. Such differences do exist among earnest and thoughtful men. No doubt these differences at times confuse the minds of those who are beginning to think on such questions.

We have had in the daily press for two months past an illustration of such difference of view in a discussion concerning what is usually called the drink question. Now, no earnest and no clear-headed man can fail to realize the misery and the crime which go with the misuse of alcoholic liquors; but the discussions to which I refer brought forward at least three distinct opinions as to the way in which this abuse should be dealt with.

One group of men believed that all social drinking of wine is wrong, and that such drinking should be prohibited by law, as other crimes are prohibited.

A second group held that, while wine-drinking was in itself harmless, nevertheless the danger of misuse is so great that all good men ought to abstain from wine and discountenance its use by others.

A third group took the ground that the question was one for each individual to settle for himself; that truth required the admission that a large number of those who drink wine use it in a rational way; that temperance and truth lie along the same path; that the real lesson which mankind has to learn is the lesson of self-control and of rational living.

It is not my purpose to discuss any of these views, all of which have been earnestly and conscientiously maintained. But the point to which I wish to call your attention is this. The question whether you accept the

one or the other of these views is comparatively of small importance. But it is of infinite importance to you that, in these and in similar questions, you find your own conception of the truth, as conscience and mind direct; and, having reached a result, that you have the courage to follow that conception wherever it leads. It means little for you to accept my view of truth or any other man's view of truth. It means everything to you to determine out of an open heart and an alert mind your own conception of truth, and, having done this, to keep the courage of such conviction. And if your training in science is to have any deeper meaning, if it is to connect itself not only with the problem of making a living, but also with a real philosophy of life, then the habit of open-mindedness which you have been trained to use in science, this scientific method, as it is called, is also the attitude of mind in which you should approach all questions.

There is a feeling sometimes that too much truth is not a good thing, at least for men between the ages of nineteen and twenty-four. And sometimes, when one's conceptions of truth, particularly in social and moral questions, lead directly across the conventional and traditional lines, one is tempted to ask whether, after all, it is not better to fall in with the view of other men and travel their road. All men of serious purpose, whether their lives be passed in the public view or not, face this question at one time or another; for all men who have earnestness and intelligence become leaders in greater or in less degree. In such a moment of hesitation there is one voice which speaks down the centuries—the voice of one greater than Marcus Aurelius, greater than philosopher or poet or priest, whose utterance is so clear and so straightforward that it brings courage to doubting souls and shows the way for timid hearts. That voice says, "Know the truth, and the truth shall make you free." My brothers, there is no freedom worth the having other than that freedom which a man enters into when he follows truth as his own heart and his own mind enable him to see it. Know the truth, and, as the Master

says, it shall make you free : free from discouragement and free from fear. For the real dragons that destroy men's souls are not food and drink, but the weakness which allows passion to become the master, not the slave, of the mind ; the selfishness which sees only personal interest and personal gain ; the mental lethargy which accepts error rather than seek truth ; the lack of vision which fails to recognize the truth ; the lack of moral purpose to follow the truth when it is seen ; and the fear which turns aside or renders powerless the noblest purpose and the finest conception.

There is another quality of the mind which ought also to enter into one's attitude toward truth, and which is characteristic of the scientific spirit and of the scientific method. This quality is tolerance. For how strong soever one feels himself to be in purpose, and how sure soever he may consider his conception, other men just as sincere, possibly as able, will discern truth in a different direction and approach it by a different path. No man, no party, no sect, and no religion has a divine monopoly either of truth itself or of the ways by which truth may be found. History is full of the story of those who parted, the one from the other, each to follow truth as he saw it, to find that their divergent paths came, in the end, to the same destination.

I remember one summer night watching from a hilltop two men making their way across a low, swampy meadow to a farm-house beyond. There had been an accident on the railway and they were hurrying for assistance. One of them had removed the head-light from the locomotive and was using it to find a pathway ; the other had only a brakeman's lantern. I observed that the man with the headlight went straight forward to his destination, directly across the shallow streams which intersected the meadow ; while he with the lantern wandered back and forward, tracing out the meanderings of the little streams, sometimes even going directly away. But at last he too came to the farm-house, and, when he was questioned as to these wide detours, explained that he found it necessary to go around the heads of the streams which intersected the meadow. In truth,

the streams were only a few inches deep, and the safe and direct way lay directly across them. This he with the headlight had discerned, and by so doing had accomplished quickly and easily what the other came to after long and wearisome seeking. Yet both sought the same goal, and both reached it.

It is in some such way that men with different training and different equipment arrive after all at the same truth by widely different paths, and after different expenditure of time and labor. The personal equation enters into our judgment of truth as it does into all human thinking. It is no part of the scientific teaching to deny to another the same freedom in the search for truth which he himself claims. The scientific man of all others should be tolerant.

This does not mean that the scientific method excuses a man for his failure to use all the means in his power to come at the truth. It does not forgive a man when he seeks in a devious way that which he ought to reach by a direct road. It does not hesitate to criticise a man who uses a lantern, when he might employ a locomotive headlight.

The principle that free expression of opinion is conceded to those who differ from the recognized authorities is a lesson which individuals and parties, societies and nations, have been slow to learn. This right, so far as social, political, and religious questions are concerned, is limited to-day by curious social and geographic lines. It is the boast of our Anglo-Saxon stock that political and religious freedom has found its fairest fruitage in Anglo-Saxon civilization. We who live under a *régime* which guarantees to each citizen freedom of thought and of speech do well to recall now and then the mistakes and the difficulties through which our fathers came to learn this lesson. It is a story full of the weaknesses and of the strength of humanity; a story of progress step by step, with many halts and backward steps; a story of cruelty and of devotion, of the blindness of the many and of the clear vision of the few; but a story always of human progatress word truth.

For the desire to compel other men to accept one's own view of truth has been confined to no class and to no age. It has been a very human characteristic since the days when men lived in caves and dressed in skins. Kings and priests, having had most power in their hands, have had most opportunity to use the argument of force. Mahomet found that the sword was the surest argument to convert a stubborn convert, and doubtless he was thoroughly honest in his belief. The priests who crucified Christ felt no doubt of their devotion to truth. A few centuries later those who called themselves followers of Christ found in their hands the power to persecute men for their opinions, and they did not hesitate to use it. As the Rev. John Cotton, in his controversy with Roger Williams, naïvely asserted, persecution is not wrong in itself. "It is wicked," said he, "for falsehood to persecute truth, but it is the sacred duty of truth to persecute falsehood," and that teaching bore strange fruit for New England soil.

Boston Common, scarce a stone's throw from this room, lies to-day white and fair under last night's snowfall. As we look upon it our memories go back to the days of 1775, and to those later scenes which preceded the Civil War. We think of Boston Common as sacred to liberty and to freedom and to the rights of man; and I believe there is no spot on earth more truly dedicated to human freedom. Yet it has beheld other scenes than gatherings of indignant colonists or groups of patriot citizens anxious for their country's future. Our thoughts seldom go back to that October morning in 1659, when William Robinson, Marmaduke Stevenson, and Mary Dyer were led out on Boston Common, to be hanged for teaching the doctrines of the Quakers. It is not easy for us at this day to realize that men and women could be hanged on that free soil for rejecting the doctrine of original sin and of the resurrection of the body, for denying the efficacy of baptism, and for asserting the absolute right of private judgment. And I remind you of this scene, not to compare our liberality with the narrowness of our fathers, but to call your attention to

the fact that by their very earnestness of purpose and by their examination and discussion of religious questions the fathers found the path to truth, though long and rough; persecution gave way to tolerance, and a colony founded to perpetuate a special view of divine truth became a State where any man may follow truth as his own heart and his own mind direct. And this ideal is, after all, that toward which great souls have labored in all ages. For this scientific method is no new invention of the nineteenth century. The men who have led humanity have always been those who went forward with open hearts and with clear minds. For literature and science and politics and religion are not separate and distinct things, but only different parts of the same thing; different paths by which men have sought after beauty and truth and righteousness—and these are one.

Therefore let me hope that your study of science may mean something more to you than the facts of chemistry and of physics, which you learn in the laboratory. And, if I may be remembered by you when you have left these halls, I would choose to be remembered as one who taught you to approach the problems of your duties and relations with men in the same spirit in which you approach a problem in the laboratory—to be content with no lie, to rest in no evasion of the truth; to work out, with the help of a tender conscience and an alert mind, your own conceptions of truth, and, having reached such conceptions, to follow them. And this is the answer to my question. We know truth when we reach it of our own effort and make it our truth. The politics and the religion which a man inherits, without thinking and without effort count little toward his political and his spiritual development. Men differ, and will always differ, as to what truth is in this or in that matter, but that man finds truth who seeks it; he serves truth who follows it fearlessly; he serves his fellow-men who does all this with humility and with tolerance.

In the church service of to-day is preserved a short

prayer: "Grant us in this world knowledge of thy truth, and in the world to come life everlasting." It has come down to us from one of the heroes of the early Church, him whom men called the golden-tongued; one who, after a life of devotion and of courage and of tolerance, died at the hands of ignorance and jealousy. The words of this prayer, few and simple as they are, seem to me to ask all that a human soul can ask—in this world knowledge of God's truth, in the world to come the life everlasting. The educated man, the courageous man, the tolerant man, has no other prayer.

HENRY S. PRITCHETT.

THE UNITED STATES PATENT OFFICE

As few people living at a distance from Washington have much knowledge of the character and extent of the scientific work performed in the executive departments of the government or of the qualifications required of those who are employed therein, it is believed that a series of articles on this subject, published in the *TECHNOLOGY REVIEW*, will be appreciated by its readers; and the following description of the organization and duties of the employees of the Patent Office is therefore presented as the first of these papers.*

The Patent Office is a bureau of the Department of the Interior, and as such is under the general supervision of the Secretary of the Interior. The chief of the bureau is the Commissioner of Patents, who is appointed by the President with the advice and consent of the Senate, and is assisted in the performance of his duties by an Assistant Commissioner appointed in the same manner.

In addition to the Assistant Commissioner, the Commissioner's personal staff includes two law clerks, who aid in the investigation of legal questions and the preparation of decisions, and the Chief Clerk, who has charge of the general correspondence, the distribution of the clerical force, and the reception of applications and fees.

Under Section 4886 of the Revised Statutes of the United States a patent may be granted to "any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter or any new and useful improvement thereof, not known or used by others in this country before his invention or discovery thereof and not patented or described in any printed publication, in this or any foreign country, before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in the United States for more than two years prior to his application, unless the same is proved to have been abandoned."

* See *REVIEW* for January, p. 57.

For the purpose of ascertaining the facts which are by the terms of the above statute made prerequisite to the grant of a patent, an examination as to the question of novelty is necessary. To establish the other facts, the oath of the applicant filed with his application is considered sufficient unless facts which appear to rebut the presumptions raised thereby are brought to the attention of the Commissioner.

The present field of search, which increases rapidly every year, comprises about 700,000 United States patents, including reissues and designs, 1,250,000 foreign patents, and 76,000 volumes of scientific works in the Patent Office Library.

Without a thorough classification it would be impossible to examine the 40,000 or more applications filed annually or to make searches of sufficient accuracy to justify the treatment of a patent as *prima facie* evidence of its validity. Imperfect work in this respect would render uncertain property rights to the value of millions of dollars and menace the security of all manufacturing interests based upon patents.

It is the object of classification to aid those whose duty it is to make searches to find readily such patents and printed publications as are sufficiently close in construction and analogous in use to a given structure to constitute a bar to the grant of a patent or a ground for declaring it void, if already granted.

To effect this object, the entire field of invention must be divided into classes and sub-classes sufficient in number to confine a search within reasonable limits; they must be broad enough to provide a proper place for all patents heretofore issued and also for those hereafter to be granted; they must be sufficiently certain in their composition to admit of proper titles and definitions, and should be so grouped in examining divisions as to bring analogous classes together for the sake of economy and accuracy in making examinations.

The work of devising an effective system of classification; the formation and abolition of classes and sub-classes; placing the patents therein; making the proper records of classification; the transfer of patents after classification; and the settlement of all

contests between the examining divisions as to the assignment of pending applications for examination,—are placed under the control of the classification division, which is in charge of a principal examiner with a force of assistant examiners and clerks.

The work of examining applications is divided among thirty-six principal examiners, each in charge of an examining division with a suitable force of assistants and clerks. Each principal examiner has charge of all applications in certain lines of invention, and determines whether they are in proper form and whether the invention is patentable. If so, he signs the file, and orders the case to be forwarded to issue.

If the principal examiner decides that the claims of the application are anticipated, he rejects them and informs the applicant of his decision. The claims are then subject to amendment by the applicant and further action by the examiner; and, if rejected a second time on the same references, an appeal may be taken from the decision to the board of examiners-in-chief, which consists of three members, appointed by the President and confirmed by the Senate. If the examiners-in-chief reverse the action of the principal examiner, the files are returned to him and he passes the case to issue. If, however, the action of the principal examiner is affirmed, the applicant may appeal to the Commissioner; and, in case of a decision adverse to the applicant, a further appeal may be taken to the Court of Appeals of the District of Columbia.

It frequently happens that two or more applications for the same invention are pending concurrently before the principal examiner; and, after the patentability of the claim is decided, it becomes necessary to settle which of the rival claimants is the first inventor, for to him the patent must be granted, the applications of the others being thereby rejected.

The duty of deciding the question of priority devolves upon the examiner of interferences, who is aided by a force of assistant examiners and clerks. As the first step in the proceeding, the principal examiner prepares notices specifying the parties and issues involved and enumerating the claims of each party which cover the conflicting matter. These he forwards to the Examiner of Inter-

ferences who declares an interference, sends out the notices and fixes times for the taking of testimony. After this the parties are allowed time during which they may make motions for the dissolution of the interference on various grounds, such as that no interference in fact exists, or that the interference has been improperly declared, or that the issue is not patentable, or that a party has no right to make the claim; and, if such motion is in proper form, the Examiner of Interferences will transmit it with all the papers to the principal examiner, who fixes a day for hearing the motion and then renders his decision granting or denying the motion as his judgment directs. If the motion be denied, the papers are returned to the Interference Division and the proceedings are renewed. When the testimony has been taken and filed with the Examiner of Interferences, it becomes his duty to consider the facts established thereby and to render a decision on the question of priority.

From his decision an appeal lies to the examiners-in-chief and so on through all the other tribunals mentioned with reference to appeals from the Principal Examiner. When the question of priority is finally determined, the papers are returned to the Principal Examiner who takes the necessary action, rejecting such claims of the defeated parties as were involved in the interference and passing the application of the successful party to issue.

The Issue and *Gazette* Division receives the allowed applications from the Principal Examiners, and attends to the printing and issue of the same, and also to the publication of the official *Gazette*. This division is in charge of a chief with the necessary force of clerks.

The Chief of the Draftsman's Division has charge of the inspection of the drawings filed with the applications, the reproduction of drawings, and the making of such as are ordered by applicants.

The Assignment Division records all assignments of patents, and furnishes certified copies of such records as are needed for use in the courts and for other purposes.

The positions usually sought by graduates of technical schools

are those included within the examining corps and employment in the Classification Division, the Interference Division, and the several Examining Divisions, original appointments being always made to the grade of Fourth Assistant Examiner. These* places are filled, as vacancies occur, by requisition upon the Civil Service Commission which holds the examinations and certifies the successful candidates to the Commissioner of Patents, who nominates them to the Secretary of the Interior for appointment. The examinations cover the subjects of Physics, Chemistry, Technics, Mathematics, the reading of Mechanical Drawings and French or German.*

The following table shows the number of examiners of each grade and also the number of Massachusetts Institute of Technology men:—

	<i>Total.</i>	<i>Tech. Men.</i>
Principal Examiners	36	1
First Assistant Examiners	38	1
Second Assistant Examiners	42	0
Third Assistant Examiners	51	4
Fourth Assistant Examiners	60	7

Upon reporting for duty, the new Fourth Assistant Examiner is assigned to one of the examining divisions, and under the instructions of the Principal Examiner is set to work on an application for a patent, commencing by reading the specification in connection with the drawings, noting all defects in either, and determining whether the device is operative, as described. Having done this, the next step is to make the examination, which is done entirely by drawings and covers all those belonging to the class of inventions in which the pending application is classified and also any other classes which the knowledge and ingenuity of the assistant may suggest as probable sources of information on the subject. This work requires care and close attention, and the study of analogies between numerous classes of machines and processes adds greatly to the assistant's knowledge of the mechanical arts. When

* Circulars giving the dates and places for holding examinations, and copies of their annual report, in which will be found sample papers used in past examinations, may be obtained on request addressed to the Civil Service Commission, Washington, D.C.

the search is completed, the case is reported to the Principal Examiner, who relies upon the assistant for a clear presentation of the important features of the case, and then instructs him in the application of the references or anticipating patents disclosed by the search, and determines what claims are met and which are to be allowed. From these instructions the assistant prepares the letter to the applicant informing him of the decision on his case; and the letter is signed by the Principal Examiner, and a copy mailed to the applicant or his attorney.

It will be seen that the duties of an examiner require a wide acquaintance with mechanics and technics and also a thorough knowledge of patent law. For the purpose of obtaining the latter, it is usual to take advantage of the law schools of Washington, which hold their sessions in the evening, to pursue a law course and to obtain admission to the bar as soon as possible. The examining corps of the Patent Office is largely made up of graduates of the technical schools of the country; and such an education, coupled with the practical work of the office and the legal knowledge which most of them soon acquire, has developed a body of men thoroughly trained for their work.

Promotions in the office up to the grade of principal examiner and law clerks have for many years been made, with very few exceptions, strictly upon merit as determined by the work performed and by competitive examinations based upon patent law and office practice. On account of the frequent vacancies caused by voluntary resignations, advancement has been quite rapid. The salaries of each grade are as follows:—

Commissioner	\$5,000
Assistant Commissioner	3,000
Examiners-in-chief	3,000
Law Clerks	2,500
Principal Examiners	2,500
First Assistant Examiners	1,800
Second Assistant Examiners	1,600
Third Assistant Examiners	1,400
Fourth Assistant Examiners	1,200

The hours of work are from 9 A.M. to 4 P.M., with an intermission of a half-hour, from 12 to 12.30, for lunch. This will be regarded by many as a short working day; but they will soon find that, if the time be employed in conscientious work, seven hours per day is all that can be spent in work of this confining nature without detriment to health and to the quality of the work accomplished.

The question will probably be asked, Is it advisable to enter the Patent Office for a permanent career or even to enter it at all?

I will answer the latter part of the question first, and unhesitatingly say that four or five years in the Patent Office would be well spent by any student of engineering, in view of the wide knowledge which he may obtain of the latest developments in all the arts, in which the office is always several years in advance of the text-books. In fact, there are many branches of engineering practice on which there are scarcely any text-books at all; and these can only be studied through the latest patents on the subject. Examples of this are cash registers and various forms of mechanical calculating machines and registers; the latest developments in wireless telegraphy; and the same was true in the early days of the telephone. The instruction in the general principles of law and special knowledge of patent law would be invaluable in any manufacturing or engineering work in which he might afterwards engage.

As a stepping-stone to more profitable employment outside the government service, the Patent Office possesses advantages over most of the other branches of the service; for it is the recognized school for recruits to the profession of patent law, and every year many examiners resign to engage in this work, either on their own account or at an advanced salary or as partners in established firms. In some cases manufacturing corporations have selected men from the Patent Office to take charge of all their patent business and experimental work.

The Patent Office has not the same advantages as a place of permanent employment; for the work, while requiring extensive information in a great variety of subjects and a high order of executive ability, is not of a character which is understood or appreciated

by the outside world, does not bring one into contact with it to any extent, and furnishes no opportunities to win distinction in the engineering or legal professions. The salaries, while, perhaps, sufficient for a beginner and insuring a comfortable living, are not commensurate with the ability and qualifications required, and will never provide a competency to guard against age and disability. The time required for reaching the highest attainable grade in the office, if spent in the successful practice of his profession outside the office, would insure a man much greater pecuniary rewards.

FRANK C. SKINNER, '77.

EDITORIALS

In the child's game of "Gossip" a wonderful transformation follows the repeated whispering of a single sentence from ear to ear, so that, for example, an innocent and rational question about the weather emerges as, "Do you know that they make pickles on the top of Bunker Hill Monument?" The newspapers are always playing at this game, and the following from a little weekly in an obscure town in Wales is a delightful example of its extreme results:—

From the Editor's Scrap-book.

ENCOURAGING THE STUDENTS TO DRINK.

Although many people in this country are opposed to making total abstinence compulsory on any one, there does not appear to be any recognized body of men whose avowed object is to encourage drinking. It is otherwise in the Great Republic of the West. Although we often hear of "Temperance crusades" in America, we had no idea until lately that work of a directly opposite tendency was being systematically done. The newspapers now inform us that the Massachusetts Institute of Technology, one of the leading educational institutions of America, inaugurated, at the instance of the principal, a sort of "kemmern" (*sic*), or beer garden, after the custom of German universities. Havard (*sic*) University has just taken a similar step; and the students there will hereafter be able to drink all the beer and wine they want, and know that they have the full approval of the authorities for doing so. A newspaper correspondent remarks that all which is now needed to completely "Germanize" the two institutions is to introduce the custom of duelling. Perhaps this, too, may be done in time. The only drawback is that the club closes nightly at 12.30 o'clock, which seriously cuts short the career of the flowing bowl. Even thus early pressure is being brought to bear to keep the house open an hour or so longer on Tuesday nights, when the greatest crowd is in attendance. The conduct of the authorities in these places is, we suppose, the result of an opinion that German capacity for thought is somehow connected with the German liking for beer. This is a sad error. The peculiarities of weak, strong, grave, or gay nations do not arise from the amount of alcohol which they consume. On the con-

trary, the ability of some nations to exist *in spite of* an abnormal use of alcohol is one of the puzzles which lie at the root of the mysterious thing called "race."

The only fact, though it has nothing to do with the case, that has survived the many transmutations which must have preceded the above remarkable fable is that the "Smoke Talks" of the Technology Club (at which beer is never served) take place, as a rule, on Tuesday evenings.

The newspapers have always been so kind to the Institute that to have them sacrifice the good of the college to a sensation is to be wounded in the house of one's friends. Yet it was undoubtedly their "scare-heads" which made so many persons in Boston, and even in far-off Wales, eloquent in protest before they knew what they were protesting against. Sober second thought has shown them that President Pritchett, as he so admirably points out in the article herein reprinted from the *Outlook*, was but seeking, and teaching the students under his control to seek, "the true way." This search is the supreme end of all education; and the special value of a training in science to many a young man lies in the fact that he is thereby led, as would not otherwise be possible, to seek the truth and to make his life conform to what he finds.

The most serious fault of education, whether in school, church, or home, is the fact that so many teachers—be they school-masters, clergymen, or parents—confound the appearance of truth with the truth itself, and deem their own ignorance of their pupils' lives a sufficient proof of the latter's innocence. They reason (if at all) somewhat like this: "If the young men and women for whose upbringing I am responsible observe the conventions and repeat the usual moral formulæ, I must be satisfied. If I ignore certain great evils of life, I may then believe these youth to be innocent regarding them; and if, knowing it im-

possible for them to be innocent, I may keep myself ignorant that they are not innocent, then I may still delude myself with the belief that they yet are innocent." By such cowardly sophistries have countless parents and guardians excused themselves for shirking the hard task of learning what of evil their charges know, and of fighting against that evil with the truth which it is their duty to impart.

Especially is the acceptance of the formula: *Ignorance equals innocence*, convenient in schools and colleges. When such institutions are small, those in authority make rigid rules which, if obeyed, ought to secure morality, diligence, sobriety. Then, having posted these rules and their penalties in conspicuous places, they accept their ignorance of infringements as proof that the rules have done their perfect work. When schools and colleges become so large that the authorities can no longer maintain, even theoretically, that such rules would be observed or could be enforced, they go to the opposite extreme, and, still with the false premise that *Ignorance equals innocence*, calmly shut their eyes to everything outside the recitation and examination rooms. Everybody may then "pretend," like children, that young men who cut not more than the allotted number of lectures are unspotted saints. Under these conditions the only misdemeanor seems to consist in finding out that they are not saints; for by the acquisition of this unhappy knowledge the college becomes no longer ignorant; the "blessed" equation: *Ignorance equals innocence*, is demolished; the student, since he has been found out, can be no longer considered sinless; the authorities must unseal their eyes and do something; and the whole fool's paradise vanishes away.

No man who has sand enough to come to college is, by nature, vicious; but he is often ignorant, always curious, intent to know the truth, and eager, if he be wisely led, to follow the right way.

His elders who do not, indeed, know the truth, but who, as Dr. Pritchett says, know something of the way thither, have no business to stand aside and let him flounder, seeking in evil directions and learning in evil ways, often to his eternal hurt. Every young man must, sooner or later, weigh and decide the truth for himself, generally after hard experience; but almost always he can be helped to wise decision, and saved from lifelong injuries if he be got hold of by his elders in the right way. That way is not to preach to him; neither is it to lay down rules and penalties; least of all is it to treat him as an impersonal link in the vast machinery of the college or the school. None of these methods will keep him, by a hair's breadth, from the evil path; but nine times out of ten he can be turned from that path by the admonition and the sympathy of a man in whom he has confidence, and who has the right and the power to speak the saving word. The essential thing, therefore, is to establish close and cordial relations between the elder man, who knows at least the road to truth, and the younger who, with much floundering, is trying to find that path. Those relations established, the rest will follow as a matter of course.

To expect that these relations between the college authorities and the college students will be brought about by shutting the official eyes, by taking no interest in the students' lives, by virtually saying that evil is evil only when the college knows of it, is both nonsensical and wrong. It is, of course, the easiest way of dealing with the student problem; but it is the way most disastrous to the youth himself. No one will maintain for a moment that a college president, or that the whole faculty, can know and influence individually every young man upon the college rolls; but by acknowledging that the students are human, by showing that the authorities are human, too, by exhibiting a wholesome sympathy that will attract rather than an official aloofness which repels, such an atmosphere of good will, of mutual understanding, of real respect, and of true comradeship between teacher and pupil will be created that only the most perverse youth can withstand its uplifting influence.

The concrete problem before every large college, the problem which President Pritchett has set himself to solve, is how best to establish those close and cordial relations which, in their influence upon the student's life as a man and a citizen, will mean far more to him than mathematics, chemistry, or engineering. In doing this it is impossible for the President to make the students conform wholly to his way. He must, in a measure, conform himself to theirs. And because, in doing this, he refuses to acknowledge the false formula: *Ignorance equals innocence*, because he says that it is better for the student who cares to drink at all to take beer with him than to drink liquors in the demoralizing atmosphere of a public bar, because he teaches by actual demonstration that a little license under the shelter of the college is infinitely better than unlimited license at a city hotel, the world, so long accustomed to prefer the genteel semblance of truth to the naked truth itself, stands for a while aghast. These good people who object perceive but the one fact: president and pupil actually *seeing* one another drink a glass of beer, and the possible downfall therefrom of one weak young man. But those censors will not permit themselves to see, on the one hand, that a youth so weak would have succumbed to temptation anyway; and, on the other, that this close, personal touch with a wise and manly man, this consciousness on the part of the students that here they have a friend, an adviser, a real foster-father who understands them and has them always in his thoughts, will uplift more young men in one year than all the beer in Massachusetts ever destroyed.

Two articles in the current REVIEW draw special attention to the question of museums: the digest of the *Conservatory Journal* directly, by its plans for a huge museum modelled after the Crystal Palace; the address of M. Mabillean indirectly, by the fact that he is the distinguished director of the *Musée Sociale*. The Technological Museum was to have been an important section of the Massachusetts Institute of Technology; but the School of Industrial Science,

with its rapid growth and its always urgent needs, has wholly eclipsed this feature of the original plan. Meanwhile the museum as a factor in education has lost the prominence which it possessed forty years ago. As a conspicuous protest against that subjective teaching which relied solely upon books, those objective collections were needed then. Therefore, the International Expositions, the World's Fairs, and the various industrial museums furnished from the flotsam and jetsam of those exhibitions did a public service of inestimable value. It would seem, however, that such expositions are gradually shifting their educational ground from a technological to an anthropological and æsthetic basis; for they are running more and more toward "Midways" and "World's Congresses," toward art fabrics and architectural effects.

Moreover, were a museum to-day to be created, it ought not, in this era of scientific organization, to depend for its collections upon chance purchases or upon the erratic generosity of globe-trotters and manufacturers,—the former endowing it with stray grass-cloth garments, and the latter with such odd pieces of machinery as may have no other use. A museum, to be of any value now, must be complete and always up-to-date. Every department of industry must be fully represented, and must show the very latest improvement of the last invention. Such a museum as that, however, not only requires as its director a man of phenomenal learning and extraordinary zeal; it demands also an immense expenditure of money. Supposing, however, both of these rarities to be forthcoming and the museum to be carried on as it should be maintained, who, then, are to be its beneficiaries? Two classes of persons it will of course help greatly,—students who wish to examine a machine or a process from the historical side, and inventors who are seeking every possible hint toward the development of their ideas. But the ordinary student would have little use for it, since he can get all he needs in a well-equipped laboratory and by visits to industrial establishments; and the general public would use such a museum mainly as an en-

tertainment for its visitors. None, of course, would fail to get some benefit, even though the sole motive for attendance were idle curiosity; yet it is a grave question whether the total good to be derived would be at all proportionate to the expense of maintenance. The immense sums of money needed to carry on such a museum might be more fruitfully expended, it would seem, upon research in science, pure and applied.

Museums of art are in a wholly different category, and might well be extended to include architecture, decoration, and craftsmanship. Social museums, too, could not fail at the present time to be of value in directing public attention to the social sciences, just as in the infancy of technology the expositions and their resulting museums made the public realize the tremendous scope and importance of the physical sciences. As stimulators, therefore, not as fundamental agents, museums have an important use in education; but, excepting in the direction of æsthetics, it is a temporary rather than a permanent rôle.

GENERAL INSTITUTE NEWS

CORPORATION NOTES

The two hundred and ninety-second meeting of the Corporation was held at the Institute March 12. Reports were presented by the Visiting Committees on several of the professional departments, as usual at the March meeting. Appointments by the Executive Committees were confirmed as follows: R. G. Valentine, Instructor in English; A. L. Goodrich, Assistant in Mechanical Drawing, R. G. Burnham, Assistant in Mechanical Engineering, the latter two in consequence of the resignation of Messrs. J. C. Woodsome and J. W. Smith.

The Corporation has determined through its Executive Committee that the tuition fee shall be increased to \$250 *for students entering after 1902*, in view of the present and expected financial needs of the Institute and the high cost of instruction.

FACULTY NOTES

Two large committees of the Faculty have been occupied during the present year, one in studying plans for reorganization of the administrative work of the school, the other in making a thorough examination of the curriculum. The next number of the REVIEW will probably contain a detailed account of the work of these committees. In the meantime it may be stated that the administrative changes are likely to involve, first, due provision for closer attention, by the officers of the Faculty, to the needs of students as men in their various personal and social relations; second, a greater subdivision of duties and responsibilities now concentrated in the hands of the secretary of the Faculty.

It is not expected that changes in either direction will be of a radical character or represent anything other than the evolution consequent upon new conditions, in particular the great increase in the number of students.

The direction of the work of the Committee on Courses of Study may be inferred in some measure from the following questions referred by it to sub-committees : —

Can more time be given to English Composition ?

Can more effective co-operation be secured between the English and the professional departments ?

Should French and German, after the advance of entrance requirements, be reduced below two years or be transferred (as to technical reading) to the care of the professional departments ?

How can mathematical instruction be improved ?

Can Mechanical Drawing and Descriptive Geometry be finished in the first year for all courses, some portions of present work being, perhaps, relegated to the professional departments ?

Can Physics be finished and Physical Laboratory be begun in the second year ?

Can discontinuity of work be reduced, and the number of one-hour per week courses be diminished ?

Can first year work be made a more effective test of fitness for more advanced work ?

What additional subjects, if any, should be required for admission ?

Can the present variety of work of the individual student or the number of his examinations be diminished ?

Is it practicable to offer graduate work leading to the degree of Doctor of Engineering ?

How much, if any, of the time released by increase of entrance requirements in French and German can be assigned to general studies, and how shall it be distributed ?

It need hardly be stated that the careful study of these questions will require much time and thought. Here, also, it is not expected that such changes as are made will be of a radical character, or that they will imply change of attitude on the part of the Faculty toward the fundamental objects of the Institute,— education and training.

Captain William Hovgaard of the Royal Danish Navy, whose appointment to the Faculty of the Institute was mentioned in an earlier number of the REVIEW, was born in Aarhus, Jutland, Den-

mark, in 1857. After passing through the Naval Academy at Copenhagen, he was commissioned sub-lieutenant in 1879, and lieutenant two years later. Taking part, in 1882, in the Danish Transit of Venus Expedition to St. Croix, he entered the next year the Royal Naval College at Greenwich, and was graduated from the course in Naval Architecture. From 1887 to 1894 he was stationed at the Navy Yard, Copenhagen, in the technical department, being occupied largely in the designing and construction of torpedo boats. At the same time he was instructor in technology in the Dock Yard School of Ship-building and Engineering, and was sub-director of the shipyard of Burmeister & Wains, where, under his direction, many large vessels, including the imperial Russian yacht "Standart" and an Ice-breaker for Vladivostock harbor, were constructed.

In 1897 he was promoted to the rank of commander, and in the following two years took special courses in gunnery and torpedoes and made cruises in war vessels. Having devoted himself to the special study and design of the sub-marine boat, he was in 1901 sent to the United States to study this question, together with various other technical matters relating to the navy. He was also appointed aide-de-camp to the Danish minister of marine. At the beginning of the present college year he received appointment as professor of Naval Design in the Faculty of the Institute. His special work is with the Naval Academy graduates who have been sent to the M. I. T. for a graduate course in Naval Engineering.

Captain Hovgaard has published a book on "Sub-marine Boats," and has contributed many articles to the technical journals of Great Britain and Denmark. A notable work in his own country has been the issuing of books and articles advocating a more general introduction of sports and physical exercises among the youth of Denmark.

By the resignation of Professor Ripley to accept the chair of economics at Harvard University, the Institute will lose at the end of the present college year the services of one of its most brilliant and distinguished graduates. Professor Ripley is a cousin of the

late Professor William Ripley Nichols, and was born in 1867. He was graduated in the Civil Engineering course at the Institute in 1890, was a Fellow at the Institute for one year and at Columbia for two years thereafter, and took, at the latter college, the degrees of A.M. and Ph.D. in 1893.

Returning to the Institute as Instructor in Political Economy in 1893, Mr. Ripley was successively appointed Assistant Professor, Associate Professor, and finally full Professor of Sociology and Economics. This position he resigns to assume that of Professor in Political Economy in the department of Industrial Economics and Statistics of Harvard. In addition to his teaching work at the Institute, Professor Ripley has been since 1893 Lecturer in Demography in Columbia, and, in January, 1901, was appointed Expert Agent on Transportation for the United States Industrial Commission, obtaining partial leave of absence from the Institute, and travelling widely in prosecution of the special researches necessary for this work.

Professor Ripley's best known work is "The Races of Europe," published in New York and London in 1899, and now being translated into French at Brussels. In addition to this he has published a number of papers upon anthropological and economic topics. He has been a vice-president of the American Economic Association, is a corresponding honorary member of the *Société d'Anthropologie* at Paris; *Società di Anthropologia*, Rome; *Société des Sciences Naturelles*, Cherbourg, France; *Zeewsch Genootschap vor Wetenschappen*, Middleburg, Holland; and was awarded in the present year the *Prix Bertillon*, for research work in demography, by the Anthropological Society of Paris.

Through Professor Ripley's resignation the Institute loses not only a rare teacher, but also a most valuable member of its Faculty; for he has devoted himself with great zeal and wisdom to many questions outside his teaching work, having been specially interested in questions of student life and of graduate instruction. Active also in the work of the Alumni Association and the Technology Club, it is hoped that he may be able to continue his close connection with these organizations.

PUBLICATIONS

The Annual Catalogue issued near the end of February is a portly volume of 432 pages, an increase of about forty since last year. Announcements are included of the new building for physics and electrical engineering and of the Walker Memorial. It is stated that buildings of most complete character have been planned for these purposes, and that their erection will be begun early in the spring of 1902. The buildings are expected to cost, with equipment, between four and five hundred thousand dollars, and will represent the results of the latest professional practice.

The schedules of the thirteen courses are followed by that of the course for Naval Constructors, designated as XIII. A, and by schedules of graduate courses of one year each in the departments of Mining Engineering and Metallurgy, Chemistry and Electrical Engineering. Each of these courses leads to the degree of Master of Science, as does also that for naval constructors. It is stated that the graduate schedules are presented as typical, and not as prescribed courses.

Mention is made by an inserted slip of the increase of the tuition fee to which reference has been already made. It is to be hoped that the increase may be attended by further accessions to scholarship resources which would, at present, prove entirely inadequate to the additional need.

Another paragraph mentions the appointment of Dr. Franklin W. White as medical adviser. Dr. White graduated in the department of Biology in 1890, and subsequently took his medical degree at Harvard. He has also studied abroad, and has had varied and valuable hospital experience. While definite plans have yet to be made, it is expected that Dr. White will lecture each year to first year students on personal hygiene and that students generally will consult him in cases of need.

The President's Report has been published as usual, and will be mailed with the Catalogue to all graduates, and to other readers of the REVIEW upon application.

SUMMER COURSES

Summer courses have been conducted at the Institute for the past seven years as a private undertaking on the part of the instructors, but with the sanction of the Corporation and Faculty. The Corporation has now decided to assume the financial control and responsibility for these courses, and they will be carried on under the supervision of the Faculty. It is anticipated that these changes will remove certain disadvantages connected with the wide variations of attendance, and will make the courses a better equivalent for corresponding work during the school year. The programme of courses is not at present expected to be greatly changed.

A special committee has been appointed by the Faculty to consider the question of the introduction of a fraternity association, like the Phi Beta Kappa Society of the older colleges, based on the recognition of high scholarship.

GENERAL NOTES

It was mentioned in the last number of the REVIEW that the Institute would probably accept membership in the College Entrance Examination Board, which acceptance has now been formally tendered; and Professor Tyler has been appointed to represent the Institute as a member of the board. Professors Talbot and Burton had been previously appointed chief examiners in chemistry and drawing respectively. Their participation thus far leads them to expect good results from the co-operation.

The Institute was represented at the inauguration of President Remsen of Johns Hopkins University by the President and Professors Sedgwick and Dewey. Professor Richards attended the annual banquet of the M. I. T. Society of New York.

Prof. H. W. Tyler has just been appointed head of the mathematical department.

WALKER MEMORIAL

A conference was held at the President's office, March 18, the attendance including, besides the President and members of the com-

mittee, representatives of particular graduate classes, of the Corporation, of the Faculty, and of the undergraduates. New architectural schemes were shown, involving a redistribution of the elements included in previously published sketches. While no formal action was called for, it was agreed by those present that definite architectural plans should be prepared as soon as possible with a view to beginning actual work at an early date. It was also agreed that the ground area should not be reduced, and that, if the estimates should exceed the funds expected to be available, reductions should be attempted by some diminution in the height of the building and by postponing as much as possible of the interior accessories. The Department of Architecture has undertaken the early preparation of new plans and estimates, and actual work should not be longer delayed. The auxiliary subscription by persons not connected with the Institute has now reached \$35,000, and is expected to be materially increased in the near future. The committee has recently sent its report to former students, with a request for co-operation on the part of all who have not thus far contributed.

SOCIETY OF ARTS

The following subjects have been presented during the winter before the Society of Arts: "Utilization of Electricity in Mines," Mr. Calvin W. Rice; "Some Features of the Isthmian Canal Question," Professor W. H. Burr, of Columbia University, member of the United States Isthmian Canal Commission; "Engineering in China," Mr. William B. Parsons, chief engineer of the New York Subway; "India Rubber: A Description of the Crude Gum and its Manufacture," Mr. Walter E. Piper; "Smoke, and its Abatement in Large Cities," Professor C. H. Benjamin, supervising engineer of Cleveland.

The following papers will be presented: April 24, "A Trip through Siberia," Hon. E. J. Hill, of Connecticut, member of the House of Representatives of the United States; and May 8, "High Potential Transmission Plants in California," Dr. F. A. C. Perrine, president of the Stanley Electric Manufacturing Company.

EXTRACTS FROM "ENGINEERING," LONDON, ENGLAND, JAN. 3, 1902.

"Whilst a great deal has been accomplished during the past few years in this country in the matter of providing facilities for the scientific training of those to be engaged in the direction of our great manufacturing industries, much still remains to be done before our technical institutions can compare in magnitude or equipment with those of America and Germany. Whilst, on the whole, ample facilities are now provided for elementary scientific training, the average Englishman is still unable to appreciate the necessity of more advanced work, so that, whilst money can readily be raised to equip almost any number of second-rate polytechnics, comparatively little is forthcoming towards the support of the institutions in which really advanced work is being carried on. . . . Our American friends used to be credited with a reputation for acquiring a mere smattering of the sciences, and for thinking this all-sufficient; but this reproach has long ceased to be applicable, and the numerous establishments in which advanced work is done in the United States are exceptionally well endowed and well equipped. Again, whilst in England the average length of the course at a technical school is three years, in America it is four; and the students can hardly enter the school less well grounded than does the average public school-boy here. In fact, most of our colleges have an extremely low standard for their entrance examinations, though there are one or two exceptions to this general rule. Experience seems to show that, whilst a three years' course suffices to give an intelligent youth a fair grasp of principles, it affords him little opportunity of carrying out research work on his own initiative, which would give him a most valuable training in compelling him to think for himself. We know that the professors of some of the principal schools have been anxious to have a fourth year's post-graduate course of this character, and, to a certain extent, have been able to carry out their wishes; but such a course, though not 'post-graduate,' forms a portion of the regular curriculum at many American schools. Not unfrequently the graduating theses in these schools have in this way made contributions of permanent value to engineering data.

"In spite of the fact that a four years' course is usual abroad, the age at which students are admitted is generally higher than in this country, being eighteen in place of fifteen or sixteen, as here. Even so the number of such students is considerably greater than here. In England, taking the figures given in the report of the Association of Technical Institutions, there were in 1900 345 third-year and 52 fourth-year engineering students at the technical schools of the United Kingdom; and of these some had entered at the age of fifteen. In the Charlottenburg Technical High School alone there were in 1900 235 third-year and 242 fourth-year students in engineering; whilst about 300 students leave annually the Massachusetts Institute of Technology, after completing a four years' course.

"Whilst the output from English schools is so low as compared with that of our principal competitors, it is to be feared that it is still, if anything, rather in excess of the demand. In the case of the Massachusetts Institute of Technology the number of applications from manufacturers for graduates is so great that every one is provided with an engagement before he completes his course. In this country most of the students find some difficulty in getting a situation at all, and even then get either no pay whatever or none to speak of, for a considerable period. This is not because they are found useless, since in more than one case within our knowledge these youngsters, whose services were gratuitous, were almost immediately put on to work previously done by some of the best-paid labor in the shops. Quite recently a large firm would consent only to take a youth of this kind as an ordinary four-year apprentice, so that, had their proposal been accepted, he would, at the age of twenty-one start at a wage of five shillings per week, and at the age of twenty-five would have been earning the munificent sum of half a guinea. In America, as already stated, the workshop managers have a higher appreciation of the advantages of a good grounding in scientific principles and of the acquirement of a habit of accurate observation. They engage technical graduates readily, and find them useful in most unexpected directions. In our last issue (870) we described how the

Bethlehem Steel Company had employed a corps of such students to conduct the investigations by which they have succeeded in reducing their staff of laborers to one-quarter its original size. It is simply impossible to conceive of a British firm dealing with a question of this kind in this way. If there was a suspicion that the laborers were too numerous for the work done, the management might possibly give a draughtsman a fortnight to look into the matter, in conjunction with a foreman; but they would never agree to keep a special staff at work for many months in a thorough investigation of the whole question, as the Bethlehem Company did. Indeed, even in the States the scheme of employing a number of inexperienced youths in such a matter excited no little ridicule when first broached; but the result has shown the acumen of the management." . . .

THE UNDERGRADUATES

ADDRESSES TO STUDENTS

The plan introduced at the Institute of bringing together the student body to listen to some distinguished man giving a twenty-minute address is proving a marked success. President Eliot, of Harvard, spoke before the students January 15, his subject being "The Scientific Professions." A fifteen-minute address to the students was given on February 13 by President Hadley of Yale on "Modern Demands upon Educated Men." A longer address from Professor Mabileau is published in this number of the REVIEW.

At a meeting of the Institute Committee, at which Dr. Pritchett was present, the question was discussed of giving prizes for the best essays on the different speakers who talk to the students in Huntington Hall. A sum of money has been offered for the purpose, so that three large prizes (the largest, perhaps, one hundred

dollars) or a number of smaller prizes might be offered. The essays would be of about a thousand words in length.

JUNIOR WEEK

The members of the different committees in connection with the Junior Week festivities are endeavoring to make the entertainments of that week better than before. The following list is that of the official functions of the week:—

- April 22. Dress Rehearsal of Tech Show, at Hollis Street Theatre.
- April 24. Technique (1903) out at noon.
- April 24. Afternoon Tea held at the "Tech" office, Rogers Building.
- April 24. Evening. Junior Promenade at Hotel Somerset.
- April 25. Tech Show at Hollis Street Theatre.

The Walker Club play has been omitted this year on account of difficulties in getting talent.

THE TECH SHOW

The students are shortly to appear in their annual theatricals, and their play for this year is noteworthy in being something that is much more distinctively "Tech" than any performance that they have ever before given. "Applied Mechanics" is to be the name of the show; and two performances are to be given at the Hollis Street Theatre on the afternoons of Tuesday, April 22, and Friday, April 25, the former of these being the public dress rehearsal.

Just a few words may be of interest regarding the story of the play. It deals with the adventures of a party of eight Tech students who are travelling in Germany, and the many interesting experiences in which they take part and the pranks which they play form the groundwork for a number of most amusing stage situations. An old master mechanic, living in a small German village, has invented a number of wonderful moving figures; and the greater part of the second act of the play is spent by the Massachusetts Institute of Technology students in applying their technical knowl-

edge to make these figures perform in public. Incidentally, there are introduced a number of charming and picturesque character dances.

Application blanks for seats have been sent out to every alumnus living in the vicinity of Boston, as well as to every student; and it is hoped that this will result in unusually well-filled houses and an enthusiastic Tech audience.

The play was written especially for the Tech students by Mrs. Janet Edmondson-Walker, and it is ably seconded by a number of charming lyrics contributed by Mr. Arthur Macy and Miss Rhoda Walker. Mrs. Walker is in general charge of the production; while Mr. John Mullaly will direct the musical parts, and Mr. John Coleman will act as master of the ballet. The committee of students in charge of the show is composed of Lawrence H. Underwood, general manager; Matt Brodie, business manager; Galen M. Harris, assistant business manager; C. A. Schmidt, stage manager; Merton L. Emerson, assistant stage manager; and Robert White, Jr., press manager.

"TECHNIQUE, 1903"

The seventeenth volume of *Technique* will be placed on sale Thursday, April 24. The efforts of the board have been directed toward diminishing rather than increasing the size of the book, improving those departments essential to it, and introducing a few new features. The book will be dedicated to the Walker Memorial. The usual high artistic standard of *Technique* has been fully maintained. Besides excellent examples of three-color work, there will be several attractive tint and two-color effects. The prize offered by the board for a cover design, won by F. Arnold Colby, '01, brought forth a generous response, the result being an original and attractive cover.

It has devolved upon the Board of Editors for the current year to take the inevitable step, the necessity for which has become more and more apparent with each succeeding year; namely, the raising of the price of the book. The price of *Technique*, 1903, will

be \$1.50. The following clipping from the *Tech* explains the necessity of this change :—

The Board of Editors of *Technique*, 1903, has decided to raise the price of *Technique* from \$1.00 to \$1.50.

The Board offers for consideration these facts. At the price of \$1.00 *Technique* is sold at approximately 40 per cent. of its cost. In other words, each copy is sold at a sacrifice of \$1.50, which must be met by the obtaining of an excessive amount of advertising. There is no other college annual comparable with *Technique* sold for \$1.00. Many are sold for \$2.50, the book costing about \$2.00. Making no allowances whatever for the size of the college or lack of time for the work, *Technique* stands second to none in the list of college annuals. As the grade of the book increases, is it natural and reasonable to expect the selling price to remain constant?

The Board does not pretend that *Technique*, 1903, is worth 50 cents more than the *Techniques* preceding it for the past three or four years. But it believes that because of the constantly increasing expense of publishing the book the time has come when the price should be raised. The Board assumes the ground that, if this action were not taken now, it would devolve upon some Board in the near future to introduce the change. Pioneering always invites difficulties, but the Board feels it a duty to make this step in advance. Some class must bear the brunt of criticism. There is no reason why '03 should shirk the responsibility.

In conclusion, the Board of Editors presents this statement,—that any surplus accruing after all expenses are paid shall be donated to the Walker Memorial Fund.

(Signed)

H. S. MORSE,
For the Board.

A NEW FRATERNITY

The Institute Committee have for several years been investigating the matter of establishing a chapter of some fraternity based on recognition of scholarship at the Institute. The matter was brought to a head recently by a formal application from the Tau Beta Pi Fraternity to establish such a chapter. The matter was referred to the Faculty for approval; and they have requested the President to appoint a committee, of which he shall himself be chairman, to consider the matter of establishing such a fraternity.

M. I. T. SONG BOOK

An endeavor is being made to compile a Technology Song Book. Dr. Pritchett is heartily in favor of the idea, and at his suggestion the Class of 1904 appointed a committee to look into the matter. This committee has been enlarged to contain members from all the classes, and will work under the direction of the Institute Committee.

BASEBALL

Currier Lang has been elected Captain of the Sophomore baseball team for 1902. Lang prepared at the Cambridge Manual Training School, and while there was considered one of the fastest pitchers and third-base men in the Inter-scholastic League. Donovan, a former Boston College pitcher, will also play on the team. Downes, manager of last year's team, was re-elected.

TRACK ATHLETICS

A student mass meeting was held in Huntington Hall, February 14, to discuss track athletics. C. A. Sawyer, who called the meeting to order, told of what the track team had accomplished, and what it might do if properly supported. He said that a trainer had been procured, and that the team would soon have a training table. He also said that very likely a triangular meet would be arranged with Brown and Dartmouth, and that at this meet, as well as at the Worcester meet, the Tech team would make a good showing. Dr. Pritchett then added a few words regarding the team and its need of support. A vote was passed to levy an assessment of fifty cents on each student for the support of the team.

M. I. T. Y. M. C. A.

At the recent M. I. T. Y. M. C. A. election the following men were chosen: president, W. C. Pickersgill; vice-president, J. R. Sanborn, '04; treasurer, A. W. Richards, '04; and secretary, R. J. King, '03.

SERVICE FOR STUDENTS

A service for students held March 9 in Emmanuel Church was well attended, and was most interesting. Rev. Leighton Parks, Bishop Lawrence, Professor A. Lawrence Lowell, and Dr. Pritchett were the speakers.

DINNERS

The Senior dinner was held at Young's Hotel March 14. A very pleasant feature of the evening was a visit from the class of '75. R. V. Brown was toastmaster, and made some remarks which were very fitting to the occasion. He then called on L. S. Cates to respond to the toast, "The Spirit of 1902." The response was ably given and warmly received. Then followed toasts from C. A. Sawyer, A. E. Lombard, and C. W. Kellogg. Besides the more formal speeches there were many interesting and well-told anecdotes of Institute life by others present. H. K. Hooker sang two solos, a quartette from the Glee Club sang, and K. C. Grant played the piano.

The Class of 1904 held its annual class dinner March 1 at the old Technology Club on Newbury Street, nearly one hundred and fifty being present. Among the speakers were President Pritchett, Leonard P. Burnham, W. T. Keen, Currier Lang, H. W. Goddard, F. Sweet, C. L. Homer, and A. C. Downes. A committee, consisting of Messrs. Broad, Wentworth, and Hadley, was appointed to arrange a list of songs to be sung at Technology student gatherings.

THE GRADUATES

The following report was made to the Alumni Association at its annual meeting, Dec. 27, 1901:—

REPORT OF THE COMMITTEE ON AFFILIATION

Since the last report made by the committee, at the annual meeting of the Alumni Association in 1900, members of the committee have held several meetings, to consider the closer affiliation of the branch or local associations to the parent association in Boston.

The committee is now composed of the following members: W. B. Snow, '82, chairman; A. G. Robbins, '86; R. A. Hale, '77; F. L. Locke, '86; A. H. Gill, '84; E. G. Thomas, '87; W. A. Johnston, '92, secretary; and the secretaries of the branch or local associations in New York, Western New York, Connecticut Valley, Merrimack Valley, Philadelphia, Pittsburg, Washington, the North-western at Chicago, and the Western at Denver.

As a means of furthering the community of interests among all Tech men and organizations, the Committee on Affiliation beg to submit the following suggestions:—

“That a permanent organization be created, some of whose duties might be as follows:—

“1. To collect information regarding the geographical distribution of Institute men, to recommend the organization of local associations where the number of men seems to make it desirable, and to assist in the formation of such associations, when requested.

“2. To promote the formation of the local associations on a uniform basis.

“3. To periodically notify the local associations of the change of address of Institute men to their respective localities.

“4. To notify the local associations of the proposed visit to their localities of any prominent alumnus or professor who would be available as a speaker at one of their meetings.

“5. To forward information to the various organizations concerning changes going on in Boston in the way of buildings, changes of courses, and

any information concerning clubs and committee rooms for the benefit of any visiting graduates in Boston.

“6. To make a more equitable adjustment of the dues.

“7. To decide upon some form of letter-head for the local associations similar to that used by the association of engineering societies.”

The members of the Committee believe that it would not be wise to introduce new machinery to put these suggestions in operation, and that we ought to make use of the facilities we already have at hand.

The permanent organization should have in its membership representatives of all the organizations interested.

We believe that the Association of Class Secretaries, which consists of the secretaries of all the graduate classes, the secretaries of all the local alumni associations, the president and secretary of the Alumni Association, the president of the Technology Club, the secretary of the Institute, the president of the Senior Class at the Institute, and a representative of the Institute Committee, to be such a representative body as to combine all the interests involved.

The Committee on Affiliation, therefore, would respectfully recommend that the Alumni Association request the Association of Class Secretaries to act as a permanent organization to consider and carry out the suggestions which have been made by this committee and act on any new suggestions that may arise. Also that the present committee be discharged from further duty on the acceptance of this report.

Respectfully submitted,

WALTER B. SNOW, *Chairman of the Committee.*

WILLIAM A. JOHNSTON, *Secretary of the Committee.*

A. L. BOYDEN, *Secretary Technology Society, Philadelphia.*

The report of the committee was accepted. It was then

Voted, That the Association of Class Secretaries be requested to undertake the fostering and maintenance of a closer union between all graduate organizations of the Massachusetts Institute of Technology, and that said association be further requested to consider, and, so far as may appear expedient, to carry out the suggestions made by the Committee on Affiliation.

THE NORTH-WESTERN ASSOCIATION OF THE M. I. T.

On January 16 Mr. Cy DeVry and Mr. Frank Woodruff exhibited a number of unusual pictures of animals in captivity. They had about fifty lantern slides which have never before been shown, and which were very interesting. Another feature was an exhibition of Professor Carman's opaque projector,— a projecting lantern by means of which pictures of opaque objects can be thrown on the screen without slides. The demonstration was a complete success in every way, both in the accuracy of the reproductions of tints and shades of color and in the simplicity of manner with which the results were obtained. Pictures from the colored comic supplement of the *Sunday Tribune* were instantly shown on the canvas, exact in every line and detail, while several art supplements were similarly successful.

Professor Carman, in speaking of the apparatus, said: "This is the first time that it has been taken out of the laboratory since it was completed. The old style apparatus has been entirely revolutionized in this machine."

M. I. T. SOCIETY OF NEW YORK

The M. I. T. Club of New York held their seventh annual meeting and dinner at the University Club on February 8. There were fifty-seven present. Clarence DuB. Pollock, '94, and Robert S. Allyn, '98, were elected members of the Executive Committee. It was voted to suggest to the Association of Class Secretaries that they select a name which would apply to all the branch alumni organizations. The question of a club-house was discussed, and the matter left to the Executive Committee, with power to act and incorporate. It was decided to include in the annual club dues the dues of the Alumni Association, in accordance with the scheme of affiliation adopted for all alumni organizations; also, a subscription to the *TECHNOLOGY REVIEW*, that being the representative organ of the Institute.

The guest of the evening was Professor Robert H. Richards, '68,

who was welcomed as the only graduate that has been connected with the Institute from its beginning. He gave a most interesting address on the Institute and the influence it had exerted upon educational systems during the past thirty years. And it was President Pritchett's determination that the Institute should occupy the leading place during the next thirty years. His keynote is the fine old phrase, "A sound mind in a sound body." With this in view the Walker Memorial is being pushed ahead. The first \$100,000 was subscribed by the alumni, of which the last \$5,000 was raised by the class of 1901 on the morning of its graduation day. The second \$100,000 is being raised by the friends of the Institute, \$30,000 having been already subscribed.

TECHNOLOGY SOCIETY OF PHILADELPHIA

The Technology Society of Philadelphia held its fifth annual dinner at the University Club January 4, with about seventy present.

The promise of Dr. Pritchett's presence had from the first insured a meeting of unusual interest, anticipation of which was more than realized in his stirring words concerning the Institute and its future development, and in the unfeigned enjoyment of all at the opportunity of seeing and greeting him.

Other guests at the dinner were Professor Marburg, of the University of Pennsylvania, Theodore C. Search, Esq., President of the Manufacturers' Association, Dr. H. P. Talbot, of the Institute of Technology, Dr. Herbert Friedenwald, and Colonel W. A. Jones, U. S. A., all of whose speeches were of great interest and appropriate to the occasion.

Mr. Search illustrated the patriotic motives which stimulate to scientific study in Germany by telling of personal experiences there; and the applause which followed President Pritchett's felicitous allusion to Dr. Runkle's services at the Institute was most gallantly echoed when Dr. Talbot spoke of Mrs. Stinson's continued presence there, and most cordial greetings were extended to each.

It is hoped that this meeting will lead to a closer affiliation with the general Alumni Association, M. I. T., to which end a less formal meeting will be held some time in April.

There were present the following alumni and former students of M. I. T.: Conant and Herrick, '72; Stafford, '73; Webster, Lewis, and Boyden, '75; Dunbar, '79; Wood, '82; Tenney, '83; Lyle, '84; Allen and Mullins, '85; Mumford, '86; Pike, Snow, and Rankin, '89; Hopkins and Perkins, '92; Copeland, Bixby, Dorrance, Gregory, Sadtler, Barry, and Taft, '95; Bates, Bragg, Bakenhus, Crawford, Davis, Field, Goodhue, Hyde, Paul, Pennell, and Stevens, '96; Attwood, Keisker, Knowles, and J. Bancroft, '97; Long, Swift, Thurber, Bean, Pierce, Trask, and Starr, '99; Baily, Boynton, DeBerard, Horne, Miller, Murray, and Rossmassler, '01.

ASSOCIATION OF THE WOMEN OF THE M. I. T.

The second annual meeting of the Association of the Women of the Massachusetts Institute of Technology was held in the Margaret Cheney Reading-room on Saturday, December 28, 1901. About forty people were present, including Mrs. William B. Rogers. The meeting was called to order by the president, Mrs. William B. Rogers. The records of the last meeting were read and approved, as was also the report of the treasurer, which showed the finances of the society to be in a very prosperous condition. After other business had been transacted, the following officers for the ensuing year were elected: president, Mrs. Ellen H. Richards; vice-presidents, Mrs. Mabel Warren Sawyer, Miss Delia M. Stickney; corresponding secretary, Mrs. Mary Boland Pequignot; recording secretary, Miss Margaret E. Dodd; treasurer, Miss Isabel F. Hyams.

Miss Lucia Peabody, the speaker of the day, was then introduced, and gave a very interesting talk on the old days of the Woman's Laboratory at the Institute. Luncheon followed, and a very delightful social afternoon.

The Association was formed some two years ago for the pur-

pose of promoting greater fellowship among Institute women. It has proved a most successful undertaking, and its influence has already been great.

THE TECHNOLOGY CLUB

In this number of the REVIEW is the final report of the evenings of the most successful season of the club. In the earlier numbers, notices of the smoke talks until the first of January have been given. On January 3, on the eighth evening of the season, Professor George E. Hale, '90, director of the Yerkes Observatory of the University of Chicago, gave a talk on "Recent Advances in Celestial Photography." His clear outline of the work of the observatory was illustrated by many most excellent lantern slides. On the ninth evening, January 7, Mr. Leland Powers enacted "Monsieur Beaucaire" to club members and ladies. The popularity of Mr. Powers's entertainments was emphatically shown by the demand for tickets for this evening. Mr. Powers's presentation of this subject wholly charmed the audience. On the tenth evening, January 28, Professor George H. Barton, '80, gave an instructive and interesting talk on "Hawaii: Its Scenery, Peoples, and Former Political Conditions." His talk was illustrated by lantern slides. On the eleventh evening, February 11, Rev. John C. Perkins gave a talk of somewhat different character from those previously given this year, to members and ladies; it was a delightful account of Wagner's "Parsifal." It had been hoped that suitable music might be played on the pianola; but, unfortunately, only an arrangement of the "Vorspiel" could be obtained. On the twelfth evening, February 18, Professor Arthur A. Noyes, '86, as spokesman for the Institute party to Japan in the summer of 1901, told of the experiences of its several members. Magnificent lantern slides were made from photographs taken by the party; but, unfortunately, they were not shown to their best advantage because of the poor objective of the lantern, which since this lecture has been corrected. About the room were hung photographs taken by Mr. Ralph R. Lawrence. They were representative photographs of

Japan, and showed exceptional skill on the part of the photographer. On the thirteenth evening, February 24, Mr. William Barclay Parsons, chief engineer of the New York Subway, and author of "An American Engineer in China," gave a smoke talk on his work in China. The Club members were introduced to a part of the world of which many of them had never known before. Mr. Parsons's unique experiences appealed keenly to the large audience. On the fourteenth evening, March 3, Mr. Frederick H. Newell, chief hydrographer of the United States Geological Survey, gave a talk on "The Government Investigations of the Water Resources of the Country for Power, Irrigation, and Municipal Supply." Mr. Newell told the members of the work which had been carried on by the government in the West, and gave a very clear idea of what might be accomplished in the arid lands of the country by scientific methods of irrigation. On the fifteenth evening of the season, March 18, Mr. Vernon A. Field entertained the club with recitations; and the M. I. T. Musical Clubs gave good selections to the largest audience of the season. Appended is a copy of the programme:—

GLEE CLUB.

"JOHN SMITH, U.S.A." *Eugene Field.*
Mr. FIELD.

MANDOLIN CLUB.

"THE DISCOVERY OF AMERICA" *Italian Version.*
Mr. FIELD.

BANJO CLUB.

"OO7" *Kipling.*
Mr. FIELD.

QUARTETTE FROM GLEE CLUB.

"DOT LONG-HANDLED DEEPER" *C. F. Adams.*
Mr. FIELD.

MANDOLIN AND BANJO CLUBS.

"DOOLEY ON THE PRACTICE OF MEDICINE."
Mr. FIELD.

On the sixteenth evening, and the last of the season, March 25, the members of the club were pleased with the opportunity to meet Captain William Hovgaard, of the Royal Danish Navy, recently appointed Professor of Naval Design at the Institute. Captain Hovgaard gave an exceedingly clear presentation of the progress made in sub-marine boats.

In addition to the evening entertainments there has been in progress a billiard and pool tournament in charge of Mr. Ralph S. Vinal, '97. Interest has been shown in this, and probably next season another tournament will be held. Kaufman '98 won the Billiards, Gardner '94 won the Billiard Pool, and Jackson '97 won the Straight Pool. It is pleasing to note that the billiard-room has been used much more than the one in the other house. In one room of the club the game of "Ping-pong" has been placed, and is much used. During the season a pianola has been placed at the club. This makes the piano so kindly loaned to the club by Mr. Edwin C. Miller much more available; and often groups of members have concerts in the quiet room, which seems to have been turned into a music or recreation room.

Appended is a complete list of the winter's entertainments:—

ENTERTAINMENTS AT THE TECHNOLOGY CLUB, 1901-1902

1901.

- October 14. Professor Alfred E. Burton, "Sumatra." (Illustrated.)
- October 29. Miss Katherine Jewell Everts, "Jocelyn Leigh." (Ladies' night.)
- November 14. Sir Robert Stawell Ball, LL.D., D. Sc., F.R.S., "Astronomical Theory of the Ice Age." (Illustrated.)
- November 19. Captain John Bordman, Jr., "The Philippines."
- November 26. Mrs. Mabel Loomis Todd, "Tripoli." (Illustrated.) (Ladies' night.)
- December 12. Dr. Ira Remsen, "Reminiscences of Professors Sylvester and Rowland."
- December 17. Dr. Booker T. Washington, "Hand-work in Education."

1902.

- January 3. Professor George E. Hale, '90, "Recent Advances in Celestial Photography." (Illustrated.)

- January 7. Mr. Leland T. Powers, "Monsieur Beaucaire." (Ladies' night.)
- January 28. Professor George H. Barton, '80, "Hawaii: Its Scenery, Peoples, and Former Political Conditions." (Illustrated.)
- February 11. Rev. John C. Perkins, "Parsifal." (Ladies' night.)
- February 18. Professor Arthur A. Noyes, '86, "Trip of the Institute Party to Japan." (Illustrated.)
- February 24. Mr. William Barclay Parsons, "Experiences in China." (Illustrated.)
- March 3. Mr. Frederick H. Newell, '85, "The Government Investigations of the Water Resources of the Country for Power, Irrigation, and Municipal Supply." (Illustrated.)
- March 18. Concert, M. I. T. Glee, Banjo, and Mandolin Clubs, and Recitations by Mr. Vernon A. Field. (Ladies' night.)
- March 25. Captain William Hovgaard, "Submarine Boats."

NEWS FROM THE CLASSES

1868.

PROF. ROBERT H. RICHARDS, *Sec.*, Mass. Inst. of Technology,
Boston, Mass.

William E. Hoyt, of Rochester, N.Y., under date of January 1, writes in part as follows: "I am just back again [from Mexico], after an extended absence. . . . I was delegated to report in a general way on the resources of the Republic, the condition of its railroads, the opportunities for development of the country in certain districts, the need of more railroads, the indications of mineral and agricultural wealth, the extent of the great timber lands of the South, and the characteristics of the inhabitants as producers and consumers of commercial commodities. . . . A wide range of subjects, you will say, to be studied by a visitor; but every possible means was provided to make the investigation rapid and complete. First of all, there was a private car furnished, and free transportation given over all the railroads of the Republic from north to south and from the east coast to the west. Then credentials to our United States ambassador at the capitol secured formal presentations to General Diaz and his ministers, who gave us hearty welcome and constant help in pursuing our researches. . . . Mexico is a most interesting country and has a great future, if only domestic tranquillity can be assured." . . . — Herman Poole is of the firm of Poole and Bailey, manufacturing chemists, 157 West 106 Street, New York, N.Y. He is also chemist and metallurgist of the Imperial Ore Reduction Company. — The following extract is from a letter from Walter H. Sears: "During a part of the year I have been engaged in developing plans for a new source of water supply for the city of Grand Rapids, Mich., including a big dam and storage reservoir, a ten-mile conduit, etc." . . .

1870.

PROF. CHARLES R. CROSS, *Sec.*, Mass. Inst. of Technology,
Boston, Mass.

Major William H. Bixby writes as follows: "Under orders from Washington, just issued, I shall take station at Detroit, Mich., about January 15, to assume charge of the work of improvement of the St. Mary's River and canal, the ship canal between Chicago, Duluth, and Buffalo, and certain other river and harbor improvements in that neighborhood. My present work and office after January 15 will be transferred to Colonel Garrett J. Lydecker, corps of engineers, United States Army, to whom should then be addressed all communications pertaining to the Ohio River General Improvement."—O. N. Sanford has been located at San Francisco, Cal., for about two and one-half years; and for about one year and a half has been assistant engineer with the city engineer.—Professor Charles R. Cross took charge of the Physical Department on February 1 twenty-five years ago.

1874.

CHARLES F. READ, *Sec.*, Old State House, Boston.

The annual reunion of the Class Association was held at the Technology Club, Jan. 8, 1902, and was largely attended. The following officers were elected for the current year: president, George H. Barrus; vice-presidents, John C. Chase and Charles C. R. Fish; secretary and treasurer, Charles F. Read.—Charles F. Read, the secretary of the Class Association, has been elected assistant secretary of the Association of Class Secretaries of the Institute.—Charles D. Austin has charge of the erection of the new Boston Journal Building.—Gideon M. Mansfield has recently been elected treasurer of the Boston Emergency Hospital.—Francis H. Silsbee has been elected president of the Merrimack Valley Association of the M. I. T.—Amos J. Boyden has been elected secretary and treasurer of the Technology Society of Philadelphia.

1875.

E. A. W. HAMMATT, *Sec.*, 53 State Street, Boston.

Goodale writes that his address is now Butte instead of Great Falls, Mont., and that Shockley has been travelling in Western Australia for some months. There are many men who were connected with the class from whom the secretary has heard nothing for many years, and he is extremely doubtful or in absolute ignorance of their address. It would be a great favor if every '75 man who sees this would write his full name and address on a card, and mail it to E. A. W. Hammatt, 53 State Street, Boston.

1876.

JOHN R. FREEMAN, *Sec.*, 814 Banigan Building, Providence, R.I.

The dinner commemorating the twenty-fifth anniversary of the graduation of the class of 1876 was held at the Technology Club on the evening of Dec. 28, 1901. The following-named were present: Atwood, Baldwin, Blodgett, Buck, Caldwell, Fairbanks, Galloupe, Gowing, Hapgood, Hodgdon, Main, Prichard, Shillaber, Waite, and Wood. Letters were received from various members unable to be present. Mr. Buttolph telegraphed his congratulations; and Mr. Sawyer pleasantly called attention to the fact that his own son, Mr. Charles A. Sawyer, Jr., was now a Senior at Tech.—The secretary of the class visited the Pacific Coast in December, and had the pleasure on his return of passing a day with Theodore Schwarz at Denver. On December 1 Mr. Schwarz resigned the management of the Iron Silver Mine of Leadville, Col., because of the bad effect that several years' continuous work at the high altitude of Leadville was having on his health. He was just then considering seeking a warmer climate for rest and recreation during the present winter. His management of the mine has been very successful, and the market value of the stock has more than doubled during his régime. Mr. Schwarz intends resuming his former work and general practice as consulting mining

engineer, with office at Denver.—We learn that Mr. Albert H. Low is one of the most prominent and successful assayers in Denver. Most of the responsible work of that region in connection with litigation or arbitration has, for several years past, come to his firm almost as a matter of course.—William Otis Crosby in December last made a visit to the Pacific Coast and to South-western California for the purpose of studying the geological conditions in a new mining district. His services as a consulting geologist are much in demand.—Mr. Charles N. Waite spent several months abroad last summer in the interests of the Cellulose Products Company, and still devotes his time toward working out various of the chemical problems incident to placing the manufacture of an artificial silk made from wood pulp upon a commercial basis.—F. W. Hodgdon, chief engineer of the Massachusetts Harbor Commission, has recently completed his report on the practicability and cost of a ship canal from Boston to Narragansett Bay by way of Taunton, the surveys for this canal having been under Mr. Hodgdon's charge in accordance with an act of the Massachusetts legislature. The field work was largely under the charge of Mr. Henry B. Wood of '76.

1877.

RICHARD A. HALE, *Sec.*, Lawrence, Mass.

The twenty-fifth anniversary of the class was held March 13 at the Technology Club. Dr. Pritchett was the special guest of the occasion. Professor John D. Runkle, who was president at the time of the graduation of the class, was invited to be present, but, owing to poor health, was obliged to decline. The following officers were elected: Frank E. Peabody, president; Henry H. Carter, vice-president; R. A. Hale, secretary-treasurer. Mr. Peabody is of the firm of Kidder, Peabody & Co. Mr. Carter, formerly superintendent of streets, Boston, is consulting engineer and president of the Metropolitan Construction Company of Boston. President Pritchett and ex-Presidents Crafts and Runkle were elected honorary members of the Class Association. Letters of regret were read

from absent members. Among others that were present were Charles A. Clarke, of the firm of Hill, Clarke & Co., a large firm dealing in machine-shop tools and machinery, which are sent all over the world; John Alden, chemist of Pacific Mills; R. A. Hale, of the Essex Company; Walter Jenney, superintendent of the Jenney Manufacturing Company, a large oil refinery in South Boston; B. A. Williston of the Hancock Inspirator Company, and who has a son about to graduate from the Institute; Joseph P. Gray, first vice-president of the Boston Manufacturers' Mutual Insurance Company; H. C. Southworth, connected with the commission on grade crossings and mining engineer; George A. Nelson, assistant city engineer, Lowell; T. F. Stimpson, superintendent of printing department of the Silver Spring Bleaching and Dyeing Company, Providence; E. Clement, with Clement, Parker & Co., stock brokers, Boston; Professor Linus Faunce, associate professor of drawing, Massachusetts Institute of Technology; Charles F. Lawton, superintendent of board of public works of New Bedford; W. H. Beeching and E. Fairbanks, in business in Boston; Benjamin C. Mudge of Lynn; and Albert S. Glover of the Hersey Meter Company of Boston. Letters were received from W. E. Chamberlin, architect, Cambridge; George W. Kittredge, chief engineer of the C. C. C. & St. L. Ry., Cincinnati; John E. Hardman, consulting mining engineer, Montreal; George H. Hewitt, mining engineer, who has recently been down in the vicinity of the Panama Canal. Remarks relating to the growth and progress of the Institute and the necessity of providing new buildings for the constantly increasing number of students were made by President Pritchett, and discussion followed by H. H. Carter and others. A class directory will be published later, giving more detailed information.

1878.

LINWOOD O. TOWNE, *Sec.*, Haverhill, Mass.

The class held its annual reunion and supper at Young's the evening of January 2. Like all such occasions with this class,

nothing of a formal nature was introduced. The nearest approach to an event was the sending in of his card by a reporter, anxious to learn the status of '78 regarding President Pritchett's policy. It was deemed wise to simply send word by the waiter that it met the entire approval of those present. The knight of the quill was not invited even to gaze upon our festive board. Whether or not he felt slighted, it is certain that the morning paper somewhat reflected his mental attitude in flights of imagination, not only as to the ardor (not to say hilarity) evinced by those at the supper, but his list of names printed as apparently present were evidently almost as flightily abstracted from some Tech catalogue, many of the men told off by his pen not having shown up at a class reunion for years. Those actually present were C. M. Baker, president, Isaac Rich, J. W. Sargent, E. P. Collier, J. W. Rollins, Jr., E. J. Nichols, Professor P. Schwamb, E. F. Williams, L. O. Towne.

1879.

HARRY H. CAMPBELL, *Sec.*, Steelton, Pa.

E. C. Miller has been elected president of the Boston Music Trade Association.—H. H. Campbell has published a book which is the second edition of a former work, "The Manufacture and Properties of Structural Steel." This book has about seven hundred pages, and is called "The Manufacture of Iron and Steel." It is not only enlarged in the metallurgical portion, but devotes one-quarter of the volume to an account of the present state of the iron industry in the leading countries of the world.

1881.

FRANK E. CAME, *Sec.*, 17 Place d'Armes Hill, Montreal, P.Q., Canada.

William B. Revere is now at Salem as superintendent of the Morrill Leather Company's large sheepskin tannery there.—Mrs. John Duff is an exceedingly active member of the Boston School

Committee.—Dave Bissell is president of the Duquesne Forge Company at Pittsburg.—Ex-Governor Frank W. Rollins has spent most of his time in Boston this winter.—Walter J. Koehler died last spring in Australia.—W. R. Snead, president of the Snead & Co. Iron Works of Jersey City, N.J., died March 27.

1882.

WALTER B. SNOW, *Sec.*, Watertown, Mass.

Upon the evening of February 6 the class observed its twentieth anniversary dinner at the Technology Club, and several members met for the first time since graduation. Those present were: Cheney, Darrow, French, Gooding, Hall, Herrick, Jenkins, Low, Munroe, H. F. Ross, W. B. Snow, A. W. Walker, and Warren.—Brackett has been quite ill, and at last accounts anticipated going away for a complete change.—At the time of the anniversary dinner, Gerry was engaged with a survey party at Harwich, Mass. He is resident engineer with the Massachusetts Highway Commission, with headquarters usually at Boston.—The firm of Fred-eric B. Cochran, of New York, has been dissolved by mutual consent; and a new firm has been founded under the name of Cochran, Duryea & Co. Cochran writes: "I joined the New York Stock Exchange in January, 1894, and sold my seat there in December, 1901. After eight years of very active business there I was anxious to relieve myself of some of the confinement that close attention to the business required, and assigned that duty to one of my younger partners."—Herrick is now a member of the American Chemical Society and the Society of Chemical Industry of London.—Mrs. Carrie L. Rice Clark has just removed from Phoenix, Ariz., where she has resided for a number of years, to Los Angeles, Cal.—One of the notable speeches at the Reciprocity Convention was made by Deering, one of the six vice-presidents. Following are a few extracts:—

I stand before the Convention as the advocate of those manufacturers who produce a surplus and must find a market for it abroad. Their number is

already large, is rapidly increasing, and will increase still more rapidly if this Convention can take wise action, which in turn may be followed by wise legislation on the part of Congress. . . . "The nations are learning as nations what the shrewd business man has always known — that he who has the best bargain to offer can obtain the best bargain in return. The struggle is keen and will grow keener ; and America, if she wishes to advance or even to hold her industrial and commercial position in the world, must prepare and sharpen her weapons. An inflexible tariff system, before which, in all items and at all times, the small and the large customer stand on an equality, will certainly drive the large customer to the market where he can obtain special consideration and a better bargain. . . .

Many of us believe that reciprocity offers a way out of our difficulties, but reciprocity without two contracting parties and a contract is as barren as faith without works. It is probably true that few American manufacturers are opposed to reciprocity in the abstract, but each manufacturer would wish to have a voice in dictating what the American concessions to reciprocity should be. A unanimous vote approving of the principle of reciprocity would be aimless and futile. Approval of some practical measure of reciprocity already potentially accomplished or to be accomplished is the best method by which a definite result can be obtained. Reciprocity treatise negotiated under the direction of President McKinley have attempted to put the policy of reciprocity into action. Such of them as have not expired by limitation are before the Senate unacted upon. Typical and most important of these is the treaty with France, of which President McKinley said that it was a fair bargain, really injurious to no American interest, and well worthy of the acceptance of the American people. . . .

America is no longer an infant country — its steel industry is in long trousers, and very long trousers ; its packing industries have put aside their rattles. Is it not possible that some of its industrial babies, if taken out of the crib and planted on their feet, would soon run to find places at the head of the industrial procession, make a surplus, and seek a foreign market? Do we need an average protection of $52\frac{1}{3}$ per cent.? If we do, then Dingley figured in vain, and McKinley's wisdom was that of the prophet crying to deaf ears. We come together in this convention, not as advocates, but rather as judges, not so much to teach the truth as to learn the truth. Believing, as I do, that the French reciprocity treaty furnishes the quickest and simplest method of proving to ourselves, the country, and the world that we are not to turn our backs on our industrial destiny; yet I am prepared to say that, if it should appear that irreparable or serious injury would be done to an im-

portant American industry by the ratification of this treaty, I shall be the first to call for some other solution of our problem. Such investigations of the question as I have been able to make cause me to believe, however, that the injuries expected are problematical in all cases and imaginary in most. . . .

It is proverbially the first step that costs. The French treaty once ratified, reciprocity ceases to be a theory and a catchword and becomes a living force—a force without which America can never march on to her possible destiny as the greatest exporter of manufactured goods in the history of the world. If the French treaty is not to be ratified, what then? Another plank in another Republican platform approving of reciprocity and another overwhelming indorsement of reciprocity at the polls? Can we believe this? Can all of the people be fooled all of the time? If the French treaty is not to be ratified, what act is to be done to satisfy the American farmer and the American manufacturer and his working people that their products are not to be shut out of foreign markets? It must be some act that is definite, vital, practical, and prompt. Can such a reciprocity treaty be made that it will fill no one's mind with conjectural fear of problematical damage to his own interests? If in the wisdom of this Convention it is found not best to indorse the French treaty, I ask in the name of the American farmer, and that American manufacturer who now exports any of his wares, and that other American manufacturer who might some day export some of his wares, that the delegates to the convention be not sent away with nothing better than a sound or some empty form of words. We have now reached the critical stage in our industrial progress. During the generation that followed the Civil War our manufacturers had before them the apparently unlimited demand of our home market, which gave full scope to their enterprise and ambition. Secure against foreign competition we doubled and quadrupled our output, and multiplied it again tenfold, and the question of foreign markets for a conjectural surplus was a matter to which we gave little or no attention. But, now that the protective system has done its great work, we are confronted by new problems that are more serious than the old. The enterprise and ambition of our manufacturers constitute a vital force of irresistible potential—a force that cannot be arrested at will like the motion of an engine or a machine. If we cannot go forward and find new markets to absorb our increasing output, it is inevitable that we shall turn upon ourselves and waste in destructive competition the energy that might, with a proper outlet, give us command of the markets of the world. It is axiomatic that with industry stagnant and mills half idle the country at large cannot prosper. Call it what we may, whether practical

reciprocity or commercial treaties or a maximum and minimum tariff (and all come in the end to what we call reciprocity), a way out of the difficulties that are facing us must be found, and found promptly. . . .

— Wood was in attendance as a delegate at the same convention.— Faunce reports that the Pennsylvania Smelting Company, of which he is president, has just completed additions to the plant which will double the capacity.— Frost has changed his residence to 3958 Drexel Boulevard, Chicago.— Johnson is vice-president of the Western Electric and Machinery Company of Riverside, Cal. He reports that in the line of his professional work he has “built some electric railroads, laid some pipes and sewers, indulged in some concrete construction,” etc.— Strickland was fully expected at the class dinner, but circumstances prevented. He was for some time connected with Ross & Howell of Bangor, Me., but is now with the Union Iron Works of the same city.

1883.

HARVEY S. CHASE, *Sec.*, 8 Congress Street, Boston, Mass.

George J. Foran is manager of the condenser departments of the consolidated Worthington, Snow-Holly-Laidlaw-Dunn-Gordon-Blake-Knowles-Deane-Clayton Companies of 114 Liberty Street, New York. His home is 471 Central Park, West.

1885.

PROF. E. B. HOMER, *Sec.*, R.I. School of Design, Providence, R.I.

Following is an extract from a letter received from Morris L. Greely, of Wannetka, Ill.: “I seldom hear from any of the '85 boys, and much less see them. About the only time I hear from old Tech. is when they send to ask me to subscribe to something. . . . My career since I left the Tech. has not been one to interest any one especially,—simply the life of an ordinary mortal plugging every day for his grub. I have spent practically all the time sur-

veying in and about Chicago. I have no report to make of any literary productions or any investigations of my own. My political aspirations have been assuaged by one term as village father, and at present I am serving my second term as president of our school board. I have been married ten years, and have two pair to show for it, the two little girls being the younger. All are well, strong, and active. A happy and united family,—what more can one want? As to myself, my friends and the scales tell me I have grown fat,—a gain of about forty pounds since you last saw me. I am neither bald nor gray-headed, and can still see a joke. As you probably know, Tom Fry has become amphibious, and spends half of his time in Chicago now, during which periods we see him more or less, much to our delight.” The letter closes with a most cordial invitation to enjoy the Lake breezes at his home.

1886.

PROF. ARTHUR G. ROBBINS, *Sec.*, Mass. Inst. of Technology,
Boston.

Duff has in print a new work on the Packing-house Industry and the Cotton-seed Oil Industry.—Locke has recently been promoted from assistant superintendent to superintendent of factories of the Boston Rubber Shoe Company.—Seavey is teacher of drawing in the Boston evening schools.—J. Waldo Smith has recently been engaged in constructing a large mechanical filtration plant made entirely of concrete.—C. F. Smith has recently been made an LL.B., and has removed to Washington, D.C., where he is assistant examiner in the United States Patent Office.

1887.

EDWARD G. THOMAS, *Sec.*, 4 State Street, Boston.

T. W. Sprague is in Southern California on a trip to last about three weeks. He will visit some Arizona mining properties on the way, possibly.—Henry J. Conant has been elected second vice-president

of the Westinghouse, Church, Kerr Company. He will continue to make his headquarters in New York.—Granger Whitney was married on the 5th of March to Miss Julia Pittman, at Detroit.—Stoughton Walker's family has been increased by another boy.—H. C. Spaulding is now secretary of Almon, Sargent & Conant, electrical engineers and contractors, and may be found in their offices in the Equitable Building, Boston.—David H. S. Tappan has recently been discovered down in North Carolina, where he is vice-president and general manager of the Boston and Carolina Mining Company of Bakersville.—The annual meeting and dinner of the class was held at Young's Hotel, Boston, on the evening of February 21, President H. F. Bryant presiding. There were present H. S. Adams, Bryant, Cooley, Cameron, Coburn, Hussey, Lane, H. D. Sears, Spaulding, Souther, Taintor, E. G. Thomas, Very, W. A. Whitney, and Young. The officers for the ensuing year are as follows: president, W. A. Whitney; vice-presidents, Souther and Cooley. It was voted to celebrate the fifteenth anniversary of our graduation by a meeting to be held some time during the summer at some seashore point; and a committee, consisting of H. D. Sears, E. G. Thomas, W. A. Whitney, G. W. Davenport, and J. A. Cameron, were chosen to take in charge the arrangements for the meeting. After the dinner and business meeting had been disposed of, we indulged in a ping-pong tournament, which proved so interesting that all stayed to a late hour; and trade in ping-pong sets at Wright & Ditson's was very good for the next few days.—Herbert M. Howes has recently returned from New York, and now occupies the position of assistant business manager of the New York *Commercial*, with offices at 15 Court Square, Boston, Mass.

1888.

WILLIAM G. SNOW, Sec., 245 North Broad Street, Philadelphia, Pa.

Class of 1888 was represented at the alumni dinner at the Brunswick by Bradley, Childs, Robb, Sawyer, Snow, Stone, and

Webster.—Mr. Munn, one of our few representatives in journalism, who resides in Springfield, represented the Connecticut Valley Association at the meeting of the Class Secretaries on Affiliation on December 22.—W. G. Besler, general superintendent of the Philadelphia and Reading Railway, was a guest of the Baldwin Locomotive Works at a banquet given at the Union League Club, Philadelphia, February 27, celebrating the completion of seventy years of business and their twenty thousandth locomotive.—Harold Binney was abroad on a business trip for several weeks in January.—C. A. Stone and E. S. Webster have become members of the Boston Society of Civil Engineers.—L. A. Ferguson was elected a member of the Executive Committee of the Alumni Association.—W. H. Blood, Jr., has recently taken an extended Western trip in connection with his electrical works.—B. G. Buttolph was present at the dinner of the Providence Tech men, attended by President Pritchett.

1889.

WALTER H. KILHAM, *Sec.*, 9 Park Street, Boston, Mass.

Edward S. Hutchins died at Bath, Me., Dec. 25, 1901. At the time of his death he was employed as chief engineer draughtsman at the Bath Iron Works, with which concern he had been connected since leaving the Institute. He was one of the organizers of the Kennebec Yacht Club, Bath, and was its Commodore at the time of his death, which was due to nervous prostration. He leaves one sister, Mrs. George F. Butts, of Providence.—George C. Harding is in practice as an architect at Pittsfield, Mass. On the first of January last he associated Mr. Henry M. Seaver in practice with himself under the firm name of Harding & Seaver.—At the dinner of the Technology Society of Philadelphia, held at the University Club in that city, January 4, Pike and Rankin of '89 were present.—At the alumni dinner held in December last at the Brunswick the following members of '89 were present: Laws, Williston, Hobbs, Kilham, W. L. Smith, Bliss, William S.

Johnson, and Bartlett.—A dinner and reunion was held on the evening of March 28, 1902, at the new Technology Club house, 83 Newbury Street, Boston. There were present at dinner—Ayer, Bridges, Davis, Estabrook, Fiske, Hobbs, Howard, W. S. Johnson, Kilham, Lewis, Hollis French, Marsh, Mott, A. E. Norris, E. E. Pierce, Sauveur, Spalding, Thorp, Thurber, Truesdell, Whiting, Ashton. G. R. Alley was present, but was obliged to leave before the dinner. It was voted to send the class book to all members of the class. The old board of officers was re-elected. The class books were then distributed to those present. Jasper Whiting, who has just returned from the East, read a most interesting account of his adventures as war correspondent of the *Westminster Gazette* during the late war in China. After singing a few familiar songs and hearing one of Marsh's capital solos the reunion broke up.—The class books were mailed on March 29 to all members of the class whose address is known to the class officers. Any members who may have been overlooked can receive one by addressing the Secretary.—A few errors have crept into the book, owing to the fact that the corrected manuscript was all lost by the printers and could not be thoroughly gone over again.

1890.

GEORGE L. GILMORE, *Sec.*, Lexington, Mass.

Dr. F. W. White has lately been appointed physician to outpatients in the Boston City Hospital.—George L. Gilmore started for California on February 18 on a six weeks' outing with his golf clubs and Mrs. Gilmore. He took a list of the members of the class that he was liable to run across, and hoped he could collect some back dues before his return, if personal presentation counts for anything.—Paul Kendricken died on February 20 in New York. For four years he has been in New York, working as a mechanical engineer, and for some time was employed on the Forty-second Street section of the New York Railroad tunnel.—The following extracts are taken from an article in the *Electri-*

cal World and Engineer of January 25, under the heading "Electrical Engineers of the Day":—

Mr. Calvin Winsor Rice was born in Winchester, Mass., on Nov. 4, 1868. He is of Puritan stock, descended from Governor Winslow, of the Massachusetts Bay Colony. Most of his early life was spent in the vicinity of Boston Mass.; and his education was obtained in the public schools of Massachusetts. Entering the electrical engineering course of the Massachusetts Institute of Technology in 1886, he was graduated therefrom with the class of 1890. Previous to graduation, Mr. Rice, in order to supplement his class instruction by practical knowledge, worked during summer vacations in the shops of the Thomson-Houston Electric Company of Lynn, Mass., beginning as armature winder. . . . Shortly after Mr. Rice's permanent attachment to the Thomson-Houston Electric Company, he was assigned for duty with the motor department, and assisted in the work then being newly undertaken of adapting electric motors to many of the various kinds of work with which we are now all so familiar, but which in those days presented many problems for solution. When the Thomson-Houston Electric Company consolidated with the Edison General Electric Company in 1892, and the present General Electric Company was formed, Mr. Rice was assigned to duty at the headquarters of the new company in Schenectady. . . .

At Schenectady in 1894 he contracted typhoid fever, and after recovery was chosen in 1895 to fill the position of local engineer of the Cincinnati office of the General Electric Company, where he remained until 1896, when he was called to the position of electrical superintendent of the Silver Lake Mines, Silverton, Col. At these mines there was a power transmission system, the power plant situated on the Las Animas River, transmitting over a four-mile line to the mines at an elevation of 12,500 feet above sea level. After completing the extensions for the Silver Lake plant, Mr. Rice went with the Anaconda Copper Mining Company as consulting engineer to Mr. Marcus Daly. In this position a great variety of work was performed by Mr. Rice; but his chief occupation was that of determining the engineering and commercial practicability of the development of certain water powers near Butte, Mont.

Mr. Rice returned to the East in 1898, and became the electrical engineer of the Kings County Electric Light and Power Company, Brooklyn, and took part in the equipping of the station and a complete system of feeders and mains for an alternating system. The Kings County system was only partially completed when a consolidation was effected with the Brooklyn

Edison Company, and the two systems were merged. Mr. Rice then accepted a position as electrical engineer of the Consolidated Telegraph and Electrical Subway Company, which owns and operates the high-tension subways of the city of New York. In addition to this responsible position, which he still holds, Mr. Rice was also appointed chief of the meter and testing departments of the New York Edison Company, with headquarters at 53 Duane Street, New York. In these positions Mr. Rice has been assisting in the successful consolidation of several companies into one large system, and has gathered an experience equalled by few engineers. . . . He is a member of the American Institute of Electrical Engineers, of which he is at present a manager, a member of the finance and several special committees. He is the very efficient chairman of the Institute Committee on Papers and Meetings. He is also a member of the American Society of Mechanical Engineers and a corporate member of the Brooklyn Engineers' Club.

1891.

CHARLES GARRISON, *Sec.*, Lexington, Mass.

Medorem W. Greer, who has spent the past four years in Alaska, is now in Chicago with the Underfeed Stoker Company of America, Marquette Building. This is the same business with which he was associated eight years ago in Boston.—“Jack” Highlands has lately resigned from the position of general superintendent of the Hudson River Telephone Company at Albany, and is now treasurer and manager of the Consolidated Machine Specialty Company at 102 Purchase Street, Boston.

1892.

PROF. SEVERENCE BURRAGE, *Sec.*, Purdue University, Lafayette, Ind.

W. Spencer Hutchinson is reported as working like a Trojan and making great progress at Carthage, Mo., where he went to superintend the operations of the Boston Get-there Zinc Company. He is now managing three mining properties, and doing more or less expert consulting work besides. Carthage is frightfully hot in the summer, which makes it necessary for those who can to

vacate the place during the months of July, August, and September; and Hutchinson unfortunately paid the penalty of his zeal and industry last summer by being overcome by sunstroke. This necessitated a vacation of three months in the North for convalescence; but he has quite recovered, and is probably still "catching up back numbers." — Carleton E. Davis is engaged upon a most interesting piece of engineering work as principal assistant to Mr. Morris R. Sherrerd, chief engineer to the Newark (N.J.) Board of Street and Water Commissioners. He holds a very responsible position. The city of Newark purchased, a comparatively short time ago, the works of the East Jersey Water Company, which derived its water supply from the Pequannock River, a tributary of the Passaic River in the hills about twenty-one miles from the city. This year the city of Newark is building a new reservoir at Great Notch near Upper Montclair, to be known as the Cedar Grove Reservoir, which will be, roughly speaking, about one mile long by one-half mile wide, and will give a storage capacity of about 700,000,000 gallons of water. The work will involve also the laying of about eight miles of 60-inch pipe and the driving of 3,000 feet of tunnel through the mountain lying between the reservoir and Upper Montclair. Of this work Davis is to have immediate supervision as resident engineer.—Classmates will please not infer from their failure to receive notices of '92's coming decennial celebration that the plan for a reunion has been abandoned, but merely that the class secretary is distracted by his growing interests and the demands of his professorial duties, and has not yet come to appreciate the flight of time.

1893.

FREDERIC H. FAY., *Sec.*, 60 City Hall, Boston, Mass.

The ninth annual meeting and dinner of the class was held at the Technology Club, Saturday evening, March 15, 1902, President William W. Crosby presiding. The following officers were elected for the year 1902-03: president, Grosvenor Tarbell Blood; first vice-president, Herbert Nathan Dawes; second vice-president,

Leo Walter Pickert; secretary-treasurer, Frederic Harold Fay; assistant secretary, Charles Milton Spofford. Blood and Dawes were last year respectively first and second vice-president, and the secretaries were re-elected. Next year being the tenth anniversary of the graduation of the class, the question of the proper observance of the occasion was discussed. It was voted to leave the matter to a committee consisting of the executive committee of the class and the past presidents, this committee to have full powers to act as it deems best. A vote of thanks was given the retiring president in appreciation of his labors in behalf of the class, Crosby having served the organization as second and first vice-president and president continuously from 1895 to the present time, a period of seven years. Dinner was served at 7.15 o'clock in the large dining-room of the club. The event of the evening was a half-hour talk by our guest, Lieutenant Homer B. Grant, U.S.A., who gave a very interesting account of his service in the Philippines. Lieutenant Grant and President Crosby began their military service together many years ago in the Woburn company of the Fifth Regiment, M.V.M.; and, although Crosby dropped out after coming to the Institute ("for the good of the service," *he* says), Lieutenant Grant remained in that organization in which he held a commission during the Spanish War. Later Lieutenant Grant became an officer in the Twenty-sixth United States Volunteers, and served with that regiment throughout its Philippine campaign. When the reorganization of the army was made in 1900, he was commissioned second lieutenant in the regular army and assigned to the artillery branch,—a signal compliment to one appointed from civil life. Lieutenant Grant is stationed at present at Fort Banks (Winthrop), Mass. Brief remarks were made by the newly elected officers, Blood, Dawes, and Pickert. Although the meeting adjourned at the very proper hour of 10.30 o'clock, most of the members remained at the club for an hour of pleasant social intercourse. Besides our guest, Lieutenant Grant, the following twenty-five members were present, Jackson having come over from Brooklyn, N.Y., to attend: Barnes, Bemis, Biscoe, Blood, Codman, Crosby, Dawes, F. N. Dillon, W. E. Evans, Fay, W. S. Forbes, Hopewell, D. D. Jack-

son, Johnson, A. L. Kendall, Keyes, W. B. Page, Pickert, Reynolds, Soley, Spofford, Swanton, Tomfohrde, Wallis, Whiston. — The first informal class meeting of the season of 1901-02 was held at the Technology Club on Saturday evening, January 18; and this was also the first of our meetings to be held at the new club house. The class dined together as usual, and spent the early part of the evening in pleasant social intercourse. Later Charles M. Spofford gave a most interesting talk upon the manufacture of steel, to illustrate which he exhibited a collection of lantern views. He was followed by Herbert N. Dawes, who spoke very entertainingly of a trip to Europe, made by Crosby and himself in the summer of 1901. Dawes's talk, also, was illustrated by a number of lantern slides prepared by Crosby. Sixteen members were present, as follows: Biscoe, Blood, Buchanan, Crosby, Dawes, Fay, Johnson, H. A. Morss, W. B. Page, E. S. Page, Pickert, Soley, Spofford, Swanton, Sweet, Whiston. — On Saturday, February 15, the second informal meeting of the winter was held at the Technology Club. The dinner was something of a novelty for the class, inasmuch as it consisted principally of beefsteak and beer,—a combination which proved to be very popular. As usual at these informal gatherings, a portion of the evening was given to the consideration of some subject of general interest; and on this particular evening the class was most fortunate in securing our classmate, Charles L. Norton, who spoke upon ribbed and prismatic glass. Besides being the first '93 man to sit in the Faculty of the Institute, Norton has distinguished himself by his research work in this particular field; and probably no man in America is better qualified than he to tell of the wonderful possibilities in light distribution to be attained by the use of such glass. Whether Norton or the menu offered the chief attraction, the fact remains that the attendance exceeded that of any previous informal dinner, the following twenty-four men being present: Badger, Biscoe, Blood, Codman, Crosby, Dawes, Fay, W. S. Forbes, Johnson, Keith, Keyes, Latham, H. A. Morss, Norris, Norton, E. S. Page, W. B. Page, Pickert, Soley, Spofford, Swanton, Thorndike ('94), Whiston, Wingate. — On March 5 B. M. Mitchell sailed from New York, on the "Oceanic," for

England, on his way to South Africa, where for several years he has been engaged in business. Five weeks will be required for the journey. For two years past Mitchell has served in the Volunteer Engineer Corps of the British Army, and at the present time he holds a commission as captain in that service. In a business way he is of course interested in mining, his particular field being that of selling agent of mining machinery. He is the South African representative of Frazer & Chalmers, of England and America, and is agent also for the Robbins Conveying Belt Company of New York — In a recent letter, J. Fred Hinckley writes from New York City : “ We had a very enjoyable time at our alumni dinner at the University Club on the 8th of February, being entertained by an address by Professor Richards. There were sixty men out, the largest number we have ever had at one of our dinners. You will no doubt be interested to know that the M. I. T. Society of New York contemplates establishing a Technology Club here in this city, and from the enthusiasm shown for the project at the dinner the club will no doubt materialize in a very short time. Besides myself, there were three '93 men at the dinner,—Richardson, Wadsworth (A.B.), and Yorke. H. R. Barton, '93, who usually attends our dinners, was at that time sick in a Brooklyn hospital of malarial and nervous trouble, and at one time his temperature reached the remarkably low point of 93.2 degrees. I am pleased to say that he is now home (in Englewood, N. J.) and on the road to recovery.” Hinckley himself was ill a long time about a year ago of typhoid fever ; but he has wholly recovered, and is now in better health than ever. For several years Hinckley has been chemist for B. T. Babbitt, soap manufacturer, at 82 Washington Street, New York City. Charles W. Aiken, '91, is the mechanical engineer for that concern. Hinckley lives at 1125 Park Place, Brooklyn, N. Y.— The interest of the class in municipal politics does not diminish. W. A. Soley is serving his second year as alderman-at-large of Chelsea, Mass. G. T. Blood, our newly elected class president, is a member of the common council of the city of Newburyport, his old home. E. S. Page is an alderman of Melrose, Mass. ; and it is interesting to note that he is the youngest member

of the board, while the oldest member is his father. Truly, the Page family has public spirit.— Henry A. Morss is having a cruising cutter built by the George Lawley & Son Corporation at South Boston. The boat is the design of Tans, LeMoyne & Crane of New York. She will measure thirty-five feet in length on the water line, and will be named the "Cossack." Morss expects to have her in commission early in the coming summer.— The address of W. I. Swanton is changed to "Charlestown Navy Yard, Department of Yards and Docks, Charlestown, Mass." Swanton writes: "As showing the possibilities of change, the history of my past two years may be of interest. Dec. 26, 1899, I resigned from the Boston & Albany Railroad, as inspector of bridges and masonry, to accept a position with the Union Bridge Company at Athens, Pa. I had been there but three months when I was certified by the civil service for a position on building inspection work at the Norfolk Navy Yard. I accepted, and remained there from April, 1900, to July, 1901, when I secured a six months' furlough, and went to work for the Edge Moor Plant of the American Bridge Company. I had been at Edge Moor but two months when an order came, ignoring the furlough, and transferring and promoting me to be a structural draftsman at League Island Navy Yard. On the day before Christmas (1901) I arranged an exchange, and secured a transfer to the Charlestown Yard. I thus arrived at home exactly two years to a day from the time I resigned from the Boston & Albany Railroad, having held six different positions within the two years."— The marriage of Arthur H. Jameson and Miss Rebecca Jameson took place at St. Paul's Church, Kenwood, Chicago, on the 28th or January. Mr. and Mrs. Jameson will be at home in Providence, R.I., after the 1st of March.— Laurence J. Webster was married Oct. 10, 1901, to Miss Alys May Rogers.— Edward Lawrence Wingate and Miss Abbie Copeland Corbett, both of Malden, Mass., were married Jan. 16, 1902. Mr. and Mrs. Wingate will reside in Malden. For some time Wingate has been superintendent of the G. W. & F. Smith Iron Company of Boston.— Benjamin H. Dillon was recently honored by the Governor of North

Carolina with an appointment as commissioner to represent that State at the "South Carolina, Interstate, and West Indian Exposition," commonly known as the Charleston Exposition. Dillon is located at Charlotte, N.C., where he is district inspector in charge of the inspection force in both North and South Carolina for the Hartford Steam Boiler Inspection and Insurance Company.—E. R. Kimball & Co., stock brokers, have removed to the Delta Building, 10 Post-office Square, Boston. E. R. Kimball, Jr., who commanded a company in military drill in our Freshman year, is a member of this firm.—The address of Elwyn W. Stebbins is Woodside, San Mateo County, California (R. F. D. No. 1).—At the annual meeting of the American Statistical Association, held in Boston in January last, Frederic H. Fay read a paper upon "The Method Employed in Determining the Growth of the City of Boston."—S. P. Bremer and F. F. Phinney were prominent in arranging the details of the recent Cadet show, "The Cap of Fortune."

1894.

SAMUEL C. PRESCOTT, *Sec.*, Mass. Inst. of Technology, Boston.

The annual meeting and dinner of the class was held at the Technology Club on Saturday evening, February 22, but with very small attendance. The following men were present: W. V. Batson, C. A. Howes, L. P. Lane, W. E. Piper, W. H. Pratt, S. C. Prescott, S. G. Reed, F. H. Robbins, H. A. Swanton, and A. B. Tenney. Several others had signified their intention to be present, but were undoubtedly kept away by the inclement weather. The class had as a guest of the evening Mr. William Lyman Underwood, of Belmont, and lecturer at the Institute; and after the dinner those present were entertained in a most delightful manner by Mr. Underwood, who gave one of his incomparable lectures on camp and woodland life, his subject being "In the Woods with an Indian." It is unnecessary to say that all present enjoyed his talk to the utmost. A short business meeting preceded the dinner, at which it was voted to have a special celebration of some kind in 1904 at the tenth anniversary of the graduation of the class. It is

hoped that a class book will also be issued at that time, giving a history of the class, and showing what '94 has done in its first ten years of graduate life. The matter is in the hands of the Executive Committee. The officers of the class are the same as last year: president, Samuel G. Reed; vice-president, Joseph W. Phelan; secretary-treasurer, Samuel C. Prescott; and these officers constitute the Executive Committee.—An attempt has been made to classify in a general way the positions held by '94 men. Information has been received from about one hundred and eighty men. Of these, fifteen are members of firms; thirty-six are managers or superintendents of works, mines, railroads, mills, etc.; twelve are teaching; fourteen are architects; twenty-one are chief engineers or assistant engineers; thirteen are engaged in purely commercial pursuits; and twenty-two give their occupation as "with" various firms or companies, and therefore impossible to classify exactly. Of the remainder there are five inspectors, three lawyers, and a law student, three draughtsmen, four chemists, three contractors, four designers, three bankers, three housekeepers, four in government service, and one each of the following occupations: physician, student, lecturer, editor, health officer, city electrician, librarian, roadmaster, rancher, miner, and secretary to Commission of Public Works. The list is not complete, but is interesting as showing the great range of positions of responsibility held by Institute men.—J. C. Locke is computer and draughtsman in the Topographical Bureau, Department of Highways, Brooklyn.—E. B. Waite is instructor in the American School of Correspondence of Boston.—H. N. Parker has accepted the position of health officer at Montclair, N.J.—C. D. Pollock and C. A. Meade are members of the Executive Committee of the M. I. T. Society of New York.—F. B. Abbott is teaching manual training in the Kansas State Normal School at Emporia.—G. A. Taber, assistant engineer of the Rapid Transit Commission of New York, is in charge of construction of the Central Park tunnel and of the Lenox Avenue line below 135th Street.—W. F. Spalding is in the bond business, 20 Broad Street, New York.—A. G. Robb writes that he had hoped to attend the class dinner this year, but was

unable to get away. He is superintendent of the Robb Engineering Company, Ltd., of Amherst, N.S., one of the best known firms in Canada.—J. W. Chapman is mechanical engineer for the Pratt & Whitney Company, Hartford, Conn.—W. H. Sayward, Jr., has just informed the secretary of the birth of a son, William Sewall Sayward, on April 15, 1901.—C. G. Whiton is treasurer and general manager of the New Bedford, Martha's Vineyard & Nantucket Steamboat Company. As a student, Whiton was famous for knowing the time of arrival and departure of every train and steamboat entering or leaving the city.—C. A. MacClure and his partner have removed from the Ferguson to the Keystone Building, Pittsburg. They are just completing a fifteen story, half-million-dollar office building, and are designing another to cost about a third of a million.—L. Tufts is factory manager of the American Soda Fountain Company of Boston.—R. W. Gilkey has become superintendent of the New England Brick Company.

1895.

GEORGE W. HAYDEN, *Sec.*, 493 Warren Street, Roxbury, Mass.

Thomas B. Booth has associated himself with Frederick L. Emery, Barristers' Hall, Pemberton Square, in the practice of patent law.—The following clipping is from the *Hyde Park Gazette* of January 25:—

At an early hour last Tuesday morning Rev. Dr. Hoyt, pastor of the Congregational church, and Dr. Baxter, the family physician, received a telegram from Mr. George M. Goodspeed, of McKeesport, Pa., announcing the sad intelligence that our former young townsman, Mr. Rolfe M. Ellis, only child of Mr. and Mrs. Joseph D. Ellis of 90 Beacon Street, Fairmount district, had been drowned in the river at that place at 10 P.M. Monday. Friends of the afflicted family, and especially the young people of the town who knew the unfortunate victim of the sad tragedy, share alike in the general sorrow, and sympathize most keenly with the mourning household. Mr. Ellis, in company with Miss Nellie Coursin, sister-in-law of the mayor, Mr. Goodspeed, and other young people connected with the Presbyterian church of McKeesport, were out on the river, skating, and in an unguarded moment

Mr. Ellis and Miss Coursin suddenly disappeared in an opening in the ice, and sank before help could reach them. Searching parties were at once set to work, and in less than two hours their bodies were recovered. On Wednesday evening the body of young Ellis arrived here, accompanied by Mr. Goodspeed and Mr. Perley H. Blodgett, all three of the young men being employed by the National Tube Company. Mr. Ellis was the metallurgist of the plant. Rolfe M. Ellis was born in this town, and was twenty-eight years old. He was graduated from the Fairmount Grammar and the High School, and later took a four years' course at the Massachusetts Institute of Technology. On graduating he secured employment at McKeesport, and through his influence the young men mentioned (lifelong associates here) secured lucrative positions with the great firm, making quite a colony of bright young Hyde Parkers in that enterprising Monongahela River town. The deceased was formerly a member of the Congregational church in this town, and at the time of his death he was a member of the Presbyterian church of McKeesport. In both places he was zealously identified with church, Sunday-school, and Y. M. C. A. work. The funeral services will be held at the family residence this (Friday) afternoon, Rev. Dr. Hoyt and Rev. Perley B. Davis officiating. The interment will be in Mt. Hope Cemetery. G. M. Goodspeed, P. H. Blodgett, J. M. Mackintosh, G. A. Cutter, W. W. Lewis, and F. K. Mitchell will act as pall-bearers.

From the *Boston Evening Transcript* of Tuesday, March 4:—

The following is the official recognition of the heroism of Revenue Cutter Officer Hermann Kotzschmar on the wreck of the "Walla-Walla," in which his wife, who was a daughter of Edward D. Emerson, of Wellesley Hills, perished. Mr. Kotzschmar is a graduate of the Massachusetts Institute of Technology, and was at one time stationed in this harbor.

"First Assistant Engineer HERMANN KOTZSCHMAR, R.C.S., No. 8 Walker Street, Portland, Me.:

"Sir,—Herewith is transmitted copy of a letter from Captain O. C. Hamlet, R.C.S., and also one from the firm of Goodall, Perkins & Co., agents of the Pacific Coast Steamship Company, concerning your gallant conduct upon the occasion of the disaster to the steamship 'Walla-Walla.'

"The department extends to you its recognition and appreciation of your splendid effort on the occasion referred to, and its sympathy in your great bereavement.

Respectfully,

"O. L. SPAULDING, *Assistant Secretary*.

"TREASURY DEPARTMENT, OFFICE OF THE SECRETARY,
Feb. 17, 1902."

“ Captain CHARLES F. SHOEMAKER, R.C.S., *Chief of Revenue Cutter Service*, Washington, D.C. :

“ *Sir*,— I enclose herewith a copy of a letter written by the agents of the Pacific Coast Steamship Company, which is self-explanatory ; and I beg leave to suggest that it would be a good thing for the service if the department were to publish the same with some complimentary comment on the heroic work done by Mr. Kotzschmar on the occasion referred to. I feel certain that such action would serve not only to show the sympathy which is universally felt for Mr. Kotzschmar by his brother officers in his sad bereavement, but could not fail to redound to the credit of the service at large.

“ In connection with the services performed by this officer as acknowledged by the steamship company, it may be stated that he personally unhooked both of the boat falls and put the plug in the boat when she was lowered, and stood for thirty-one hours at the steering oar with absolutely no assistance from any one of the other occupants of the boat. It is not so stated ; but it is a fact that there was not a single seaman from the lost steamer in the boat with Kotzschmar, and no one who could or would relieve him for a moment in the work of guiding the boat to the shore. When a landing was finally made, the boat was upset because no attention was paid to his directions, and men even refusing to pull an oar. It was evidently a case of every one for himself at this juncture, and Kotzschmar was left to save his wife alone. Three times he succeeded in swimming with her through the surf to the beach, and each time was borne back again by the receding waves for lack of assistance from those who had succeeded in maintaining their foothold. At a third attempt he was thrown upon the beach stunned and senseless, and his wife was swept out to sea and drowned almost under his eyes.

“ Comment on the cowardly conduct of the other occupants of the boat is unnecessary ; but I hope that some public recognition of the bravery of Mr. Kotzschmar at the hands of the department may be accorded. Respectfully yours,

“ O. C. HAMLET,

“ *Captain R.C.S., United States Revenue Cutter Service.*

“ SAN FRANCISCO, January 20.

“ P.S.— The boat contained nine passengers, all men, in addition to Mr. and Mrs. K.”

"Lieutenant HERMANN KOTZSCHMAR, R.C.S., care C. H. Lamberton, 1618 Larkin Street, City :

"*Dear Sir*,— We learn from Captain Hall, master of the 'Walla-Walla,' wrecked off Cape Mendocino on the morning of the 2d inst., that you were practically in charge of the boat which subsequently landed at Big Lagoon, near Trinidad.

"The captain and others inform us that the boat was handled by you in a most intelligent and brave manner, and that he highly appreciates your services. Captain Hall joins us in thanking you for the meritorious services rendered on that occasion.

"For the loss of her who was dearer to you than your own life we extend to you our sincere sympathy.

Yours truly,

"GOODALL, PERKINS & Co.,

"*Agents P. C. S.S. Co.*

"SAN FRANCISCO, January 8."

1896.

E. S. MANSFIELD, *Sec.*, 70 State Street, Boston, Mass.

The tenth annual meeting and dinner of the class was held at the old club-house, 71 Newbury Street, Friday evening, March 14, 1902. There were twenty-eight present. E. S. Mansfield was elected secretary, and J. A. Rockwell, M.D., assistant secretary, in place of F. E. Guptill and C. G. Hyde, resigned. A committee consisting of Mansfield, Rockwell, and Hultman was chosen to draw up a constitution to replace the one lost by fire, and report at the next meeting. A German dinner was served at 7 P.M., which was much enjoyed by those present. E. C. Hultman, acting as toast-master, introduced Professor Richards of the Institute, who talked of a recent trip to Mexico, illustrating, by lantern slides, the architecture, natural scenery, and customs of portions of the country visited by him. The lecture was very interesting and instructive. The dinner was informal and unconventional, and was attended with unbounded good-fellowship. A very interesting feature of the occasion was a simultaneous '96 dinner held in New York City, where the members of the class in that vicinity were entertained by J. W. Stickney and L. N. Whitney, and during the

evening called up the class by telephone at the Brunswick, and announced their good wishes and class enthusiasm by means of a hearty class yell which savored of the old-time class spirit.—H. D. Newell is engaged in fortification work in connection with the United States Army at Fort Stevens, Ore.—During the first part of the month of February the family of H. W. Brown was increased by the appearance of a young lady by the name of Constance.—William M. Andrew is in charge of one of the departments in the office of the General Electric Company at Cincinnati, Ohio.—George E. Merryweather has left the employ of the Brown and Sharp Manufacturing Company, Providence, R.I., and has taken the position of superintendent of the Overman Automobile Company of Chicopee, Mass.—E. A. Baldwin of the General Electric Company, Schenectady, N.Y., has just recovered from a long and serious illness caused by typhoid fever. He has been spending a short time at his former home in Dorchester.—Frank A. Thanisch is making a brief business visit in Boston and vicinity.—William G. Leary is with the General Electric Company in Schenectady, N.Y.—F. E. Guptill, formerly with the Virginia Electrical Railway and Development Company, where he was burned out some time ago, is now electrician of the Richmond Electrical Bureau, Richmond, Va.—Julian E. Woodwell, inspector of electric light plants, Treasury Department, was the consulting engineer in charge of the new central lighting and heating plant installed during the summer in the Interior Department at Washington, D.C. The Pension Building is lighted and the Patent Office is both lighted and heated from the new plant in the Land Office Building. The above work was installed under the immediate supervision of Mr. L. K. Sager, '96, assistant examiner, United States Patent Office. This work involved an expenditure of \$74,000.

1897.

JOHN A. COLLINS, JR., 55 Jackson Street, Lawrence, Mass.

Benjamin A. Howes, VI., located at Dawson, Alaska, reports himself happy and comfortable at a temperature of —70° F.—

William Binley has been transferred from the office of the United States naval constructor, Newport News, Va., to the Brooklyn Navy Yard.—Thomas F. J. Maguire has recently left the office of the supervising architect, Treasury Department, to accept the position of electrical engineer in the bureau of yards and docks, Navy Department.—Fred A. Hunnewell has been transferred from the Newport News Ship-building and Dry Dock Company to the Bureau of Construction and Repair, Navy Department, Washington.—Proctor L. Dougherty, VI., is assistant inspector, electric light plants, Treasury Department; and his duties take him to all the principal cities of the Union. Any man who is travelling from place to place in this manner should carry the latest Tech catalogue with him, and look up the whereabouts of his classmates. By doing this, many a happy reunion might be had, all the more pleasant because it was not expected.—Earl P. Mason, II., is superintendent of the Newport Engineering Works, a new company whose buildings are in process of erection at Newport, R.I. Special attention will be given to the building and repairing of steam and gas engines, launches, and automobiles; and, when one considers the nature of the summer colony at this watering place, he will admit that such a shop must be of high standard. The company will manufacture the Snecker motor for launches and automobiles. The firm are agents also for the Locomobile Company, the Spaulding St. Lawrence Company, and Marsh Motor Cycle. A side feature, and yet by no means insignificant, will be the social position of the company. We quote the following: "A novel feature will be the reception-room for the deck and engineer officers of yachts, and also for *chauffeurs*. This room will be directly over the office of the company, and will be stocked with the New York daily papers, as well as the local papers; also, the principal marine, yachting, and automobile journals. Mail matter can be sent here for delivery to yachtsmen and *chauffeurs*." The *Rudder*, the foremost yachting paper in the world, has established its official yacht station for Newport at the office of the company.

1898.

C.-E. A. WINSLOW, Hotel Oxford, Boston, Mass.

The fourth graduate dinner of the class was held at Young's Hotel, Saturday evening, December 21, at 7.30 o'clock, with twenty-one members present. A delightful evening was passed, due in great part to the pleasant talk of Professor Alfred E. Burton and the informal speeches of some half-dozen members of the class. Professor Burton told of his very interesting trip around the world, and especially brought home the fact that Institute men were to be found in all quarters of the globe. Before the dinner the annual meeting of the class was held. Mr. Winslow was elected chairman; and, after the various reports were read, the following committees were either appointed or re-elected. Committee on Informal Meetings, Messrs. Butcher, H. W. Jones, and McIntyre; Committee on Resolutions, Messrs. O. L. Leonard, chairman, and M. E. Taylor and A. R. Shedd; Dinner Committee, Messrs. J. T. Robinson, A. H. Tucker, Pratt, Anthony, and Winslow. The members of the class present were as follows: R. W. Pratt, B. F. W. Russell, H. P. Richmond, O. L. Leonard, Paul Clifford, C. F. Wing, Jr., M. E. Taylor, R. E. Daly, A. F. Porter, F. Kendall, J. T. Robinson, W. L. Learned, E. N. Curtis, S. W. Stillings, C.-E. A. Winslow, C. H. Pease, I. H. Kaufman, A. R. Shedd, H. L. Coburn, F. B. Dawes, E. F. Russ.—J. H. House, Jr., has returned from Paris, and is in New York with Carrière and Hastings. His address is 28 East 41st Street.—C. F. Smith is acting as salesman for the Consolidated Car Wheel Company of Buffalo, N.Y.—G. W. Treat is now with E. H. Rollins & Sons at 19 Milk Street, Boston.—A. F. Brewer is practising as counsellor at law in the office of Rogers & North, the Fiske Building, 89 Milk Street, Boston.—Simon Fleisher has returned to Boston, and may be found at 77 Bedford Street.—B. A. Adams is still teaching forging and elementary wood-work in the Mechanic Arts High School at Springfield. His address is, however, changed to 28 Clarendon Street.—W. D. Blackmer has

moved from Cripple Creek to Colorado Springs, where his address is the Giddings Building.—G. E. Fisher, who is now in the engineering department of the General Electric Company, was married June 1, 1899, to Miss Helen A. Cummings. His home address is 45 Walnut Street, Natick.—F. A. Spaulding has been transferred from Buffalo to the Chatauqua Division of the Pennsylvania Railroad, and is now at 4 Harriot Avenue, Oil City, Pa.—W. W. Ward has now an office at 156 Fifth Avenue, New York. He was married Aug. 22, 1900, to Miss Maude Mayer of Syracuse, N.Y. While in the office of Ernest Flagg, he was engaged on a design for the United States Naval Academy at Annapolis.—Mail for A. A. Blanchard should be addressed Physikal-Chemisches Laboratorium, Linne Str., University of Leipsic. He is a member of the American Students' Club at the University and of the Deutsche Chemicalische Gesellschaft.—R. Mommers has joined the band of good '98 men in Chicago. He is now assistant superintendent of the Chicago Factory of the Glucose Sugar Refining Company.—R. E. Wilder is still with the Cambria Steel Company at Johnstown, Pa.; and he has recently been engaged on the design and estimate of steel freight cars constructed of structural shapes. He is active in local Masonic circles.—E. B. Paige was married December 25 to Miss Justina W. Cruickshank, and is living at 8 Rhodes Avenue, Lynn.—Z. H. Long has been devoting his spare time to water sports in the neighborhood of Wilkesbarre. He is a member of the Harvey's Lake Ice Yacht Club, of the Shawanese Boat Club, and of the Susquehanna Canoe Club.—D. H. Blossom has opened an office in the Atlas Block, Salt Lake City, as a civil and mining engineer. He also holds an appointment as United States deputy mineral surveyor for Utah.—C. W. PenDell is now electrical signal inspector for the Atchison, Topeka & Santa Fé Railroad at Topeka, Kan. He was married in August, 1901, to Miss Flora Towle, of Lowell, Mass.—G. W. Craven has been teaching mechanical drawing at the night school of the Butte Business College, in addition to his regular professional work.—B. B. Priest is now at East Berlin, Conn., draughting with the American Bridge Company.—The following letter re-

ceived by the secretary from Howard L. Coburn, under date of January 26, will be of interest:—

NEW YORK, Jan. 26, 1902.

As usual '98 is to the fore. In other words, hurling defiance into the face of Superstition, thirteen of us sat down to an informal dinner on Thursday, the 23d, at the Café Boulevard. The loyal crew consisted of Allyn, Blood, Coburn, Gardner, Goodrich, Morrill, Nelson, Sargent (Allston), Tietig, Warren, Wadsworth, Byam, and Streng. Needless to say, the affair was a grand success. The '98 yell startled the good people dining at the same café, but we feel that New York will be the better spirited if a little Tech life can be injected into her system. Columbia may take heart, and show some symptoms of animation. Week before last I received an invitation to meet our old friend Weimer at the poultry show in Madison Square Garden. Weimer, who is, as you know, superintendent of the Weimer machine shops at Lebanon, Pa., is running the Exmoor Poultry Farm as a side issue. He seems to be making a great success. With twenty fowl exhibited here, he took nineteen first prizes. And from what he tells me, this has been his usual good fortune wherever he has exhibited.

During my conversation with Weimer I learned that our former classmate, Maurice Delano, is now president and manager of the Millville Poultry Farm Company at Millville, N.J., and is also secretary of the Water Fowl Club of America. In view of the showing made by these two '98 men, who dares say that a Tech training is a narrow one? I don't quite see the relation between engineering and poultry breeding, but presume it is all a process of differentiation and integration.

The M. I. T. Society of New York is to hold the annual dinner on February 8 at the University Club, and I hope to see '98 well represented. Will send you a report of the occasion. . . .

— W. Brewster has made a long leap from Plymouth to Pinar del Rio, Cuba, where he is engaged in tobacco and orange growing.— C. A. Stickney is to be congratulated on the birth of a son, Charles A., Jr., born Oct. 1, 1901.— E. R. Butterworth also boasts a son and heir, Robert Reed, born June 30, 1901.— E. A. Weimer, besides his agricultural avocations mentioned in Coburn's letter above, is engineer of the fire department of Lebanon, Pa., and recently represented that city as an expert in the test of a new system of water-works.— W. R. Strickland is locating engineer

with the Colorado Fuel and Iron Company. During the fall he made a survey for an electric train line five miles long to open up the finest white marble beds in the world. Another piece of work in his charge was the survey for a railroad over McClure Pass from Crystal River to the Gunnison coal-fields.—I. M. Chace, Jr., has come East to take a position in the city engineer's office at New Bedford, Mass. He has been recently employed on the construction of the New Bedford and Fairhaven bridge, and on surveys and plans for the abolition of grade crossings.—W. H. Tew is the European representative of the Standard Pneumatic Tool Company.—C. S. Koch is now assistant manager of the Titusville plant of the American Radiator Company.—F. F. Colcord was married to Miss Anna Frances Cooper on the evening of February 4 at the Allston Congregational Church, Allston, Mass.—C. S. Hürter has gone to Vancouver, B.C., as a chief assayer of the Dominion of Canada Assay Office. An article by him on "An Agitator Method for Cyaniding Slimes" appeared in the *Engineering and Mining Journal* for Jan. 19, 1901.—H. R. Thayer is draughting with the American Bridge Company at Pittsburg, Pa. He has a small son, Clarence Richmond, born June 11, 1901.—J. H. Larrabee is now on duty with the United States Steamship "Eagle" as hydrographic draughtsman. His address is Hydrographic Office, Navy Department, Washington, D.C.—N. C. Walpole is superintendent of the Murray Company at Dallas, Tex. His son Charles C. was born Feb. 13, 1901.—R. Tietig is now draughting with G. K. Thompson at 66 Broadway, New York, N.Y.—G. A. Hutchinson read a paper on "The Practical Application of Superheated Steam" at the May, 1901, meeting of the American Society of Mechanical Engineers, of which he is a junior member.—Besides the death of A. T. Drew, who graduated with '98, and whose obituary notice was published in the last number of the REVIEW, the class has sustained another loss. Sumner Moulton Milliken of Course I., who was assistant roadmaster on the Boston & Maine Railroad, located at Lawrence, Mass., died at his home, Saco, Me., Sunday, January 12, of typhoid fever, complicated by congestion

of the liver. The secretary hopes to secure for the next number of the REVIEW a proper appreciation of Milliken's fine and lovable nature from a member of the class who knew him well.—Asa W. Grosvenor is employed by the Pennsylvania Railroad Company as civil engineer, under the Engineer of Maintenance of Way, at Fort Wayne, Ind.—Carroll A. Bennink has received a permanent appointment as architectural draughtsman of the supervising architect, Treasury Department.—G. R. Wadsworth is now located at 521 Grand Central Station, New York, N.Y.—R. R. Bryan died on April 9, 1901.

1899.

WALTER O. ADAMS, *Sec.*, 1776 Massachusetts Avenue, North
Cambridge, Mass.

The marriage is announced of Dean Hinman to Miss Frances Dewey on Tuesday, February 18, at Pueblo, Col.—The following is an extract from a letter from J. A. Patch, who is now instructor in the Syrian Protestant College at Beirût, Syria. The announcement of vacancies to be filled may be of especial interest: "Our college has had another increase in the number of students. The registration will reach six hundred this year, including students from every country in this part of the world. I am enjoying my work thoroughly. This summer six of us took a forty days' camping trip. We went on horseback, and nine mules carried our baggage. Most of the time was spent in a grove of cedars on Mount Lebanon. On our trip we visited several ancient ruins, the most noted and grandest being those at Baalbek. We camped in the Valley of the Adonis, made famous by Greek mythology, climbed the highest mountain in Syria, and altogether had a very profitable summer. This coming year there will be two vacancies in the instructing staff to be filled, an instructor in astronomy and mathematics and another in physics and mathematics or drawing. Both positions offer opportunity for research. The observatory is well equipped for astronomical work. The instructor in physics will have charge of the physical laboratory and the X-ray laboratory, which I have

had this year. We are installing a new 5 horse-power Otto gas engine and a dynamo for the electrical work. Many interesting cases for X-ray work come to us. If there are any men whom you consider fitted for those positions, we would consider it a favor if you will put them in communication with Rev. D. Stuart Dodge, 99 John Street, New York, N. Y."—The Boston Board of Health Bacteriological Laboratory has lately published the result of its investigations upon the Boston ice supply. Mr. Burt R. Rickards was closely connected with the investigation, which gives most interesting information upon a most important subject. Mr. Rickards had entire charge of the chemical and bacteriological analysis of samples of ice from each of the seventy or more ponds supplying ice to Boston.—The bills for class dues were sent out early in February, but the receipts from some are proving very unsatisfactory. It is to be regretted that members of '99 require such frequent drumming up in these matters.

1900.

GEORGE E. RUSSELL, *Sec.*, 25 Broad Street, New York, N.Y.

Absence of the secretary from the East, where chances of meeting Tech men are numerous, accounts for lack of items in recent numbers of this paper. Now that the writer is more centrally and permanently located, it is hoped that any items of interest concerning the class members will be sent him by those holding such information.—With the approach of April comes the preparation for the annual dinner.—On Nov. 18, 1901, Clinton Draper Thurber, Course I., was married to Winifred W. Russell, of Woburn, Mass. For about a year after leaving the Institute, Thurber was connected with the Pennsylvania Steel Company at Harrisburg, but changed to accept a position in the League Island Navy Yard at Philadelphia, which he won in competitive examination. Mr. and Mrs. Thurber now reside at 4339 Pine Street, Philadelphia; and a host of friends here in the East will join in heartiest congratulations and best wishes.—A letter from F. H. Cooke conveys the information that he is connected with

the government works at Portsmouth Navy Yard, N.H. For some time after leaving Tech, Cooke was connected with the Boston Elevated Railroad.—Chester A. Richardson is now in New York City with the well-known firm of J. H. Wallace & Co., mill engineers. Associated with him in the work of draughting and design is C. Leroy Richardson, also of Course I.—Leigh Keith is another son of 1900 to be found in New York. Keith is connected with the American Telephone Company as inspector of construction.—The first prize of the *Forest and Stream* designing competition for the best all-round 25-foot water-line cruising sloop, and also the prize offered by Mr. Zerega of the New York Yacht Club for the best-arranged cabin plan, were captured by a yacht designed by Morgan Barney. He is at present engaged in yacht designing with H. C. Wintringham in New York.—George E. Russell is now in New York City with the American Car & Foundry Company. Nearly a year ago Russell left the Institute to join the same firm in Detroit, Mich. The corporation is making advances in steel car work which seems to be of interest to railroad men. He would like much to see or hear from the men at the address given at the head of these columns.—Institute men will regret to learn of the death of Edward North, 2d. He died of pneumonia, after a very short illness, at Ouray, Col., Feb. 8, 1902. Edward North was born in Utica, N.Y., Sept. 25, 1878. He was the son of S. N. Dexter North, secretary of the National Association of Wool Manufacturers and chief statistician of the United States Census. In 1887 the family moved to Albany, where Edward attended the Albany Academy; and in 1890 they came to Brookline, where he entered the Brookline High School, and soon made up his mind to prepare for the Institute. In his Senior year at the high school he was editor of the *Sagamore*, a monthly paper devoted to the interests of the school. Graduating there with the class of '96, he was awarded the William H. Lincoln gold medal for excellence in English, which is the prize most sought after in the school. North entered the Institute the following fall, and decided to take the course in mining engineering. He was an active participant in all class movements, and

was a prominent member of L'Avenir and the Mining Engineering Society. To increase his practical knowledge, he attended the Summer Schools of Mining and Metallurgy of 1898 and 1899. In the summer of 1900, almost immediately after graduating from the Institute, he received an appointment from Hon. Carroll D. Wright of the Department of Labor to go abroad for the purpose of making a report on "Coal Mine Labor in Europe," and of gathering statistics on the textile schools. On his return in October he took a post-graduate course at Harvard University, studying English, Spanish, and Metallography, besides other subjects connected in diverse ways with his chosen profession. Wishing to become acquainted with some mining locality in a general way before settling down in any one place, he applied for a position with the United States Geological Survey, and was appointed to a field party about to start work in the Colorado Mountains, in the neighborhood of Ouray. He remained there until October, when, having a desire to gain a closer insight into Colorado methods of mining and metallurgy, he threw in his lot with the Camp Bird Mines, owned by Mr. Thomas F. Walsh, of Washington. For some six weeks he was engaged as an assistant in the Stamp Mill, and, as opportunity offered, was transferred to the Cyanide Works, where he occupied the post of vat and precipitation man for some three months. The work in the Cyanide Department having an injurious effect on North's health, he determined to abandon, for a time at least, that branch of metallurgy; and, after a very short rest, he went to the mine to familiarize himself with mining operations. His stay at the mines was necessarily brief, for after a few days he contracted a severe cold, which later developed into pneumonia; and, after remaining at his post long after he should have been in bed, he went down to his room at Ouray, thinking that he had the grip. Here he became much worse, and his death occurred very suddenly on Feb. 8, 1902. North's heart was in his work, and his energy and close attention to his duties were appreciated by all who knew him. He was held in the highest esteem by his coworkers, and the cutting short of so brilliant a career had a most depressing effect upon them.

RESOLUTIONS.

Whereas death has taken from our number Edward North, 2d, and we as friends have been made to mourn his loss ; and

Whereas, as comrades for four years, we were associated with him, and came to know and understand the pure heart, high purpose, and resolute determination that always guided him in all his ways, and made him a marked man among the mass of men,—

Resolved, That we do honor his name and memory by bearing open testimony to his manly life, so well lived out while among us, and to his sterling character, which was often shown to those around through never failing charity and acts of kindness.

Resolved, That a copy of these resolutions be sent to his family as an evidence of our sincere sympathy, and shall herewith be made a part of our Class Records.

GEORGE EDMUND RUSSELL, *Sec.* 1900.

EDWARD E. BUGBEE, Course III.

1901.

ALBERT W. HIGGINS, *Sec.*, Saylesville, R.I.

The class held a smoke talk at the Technology Club Thursday evening, Feb. 27, 1902. H. K. Burrison told very interestingly of his various trips through the West, especially pointing out the wonderful scenery of Arizona, New Mexico, and Colorado. The talk was illustrated with the stereopticon, many of the views having been taken by Mr. Burrison. The social hour following was very much enjoyed by all. About twenty-five members of the class were present. Probably in April there will be another reunion, and it is to be hoped that more men will find it possible to attend. So far the secretary has received only about one hundred replies to the blanks sent out. Shortly another set will be mailed ; and it is certainly earnestly desired that they be filled and returned at once, so that our records can be complete and up to date. At least it will be impossible for us to get out our catalogue for a long time, unless these are more carefully and promptly attended to.— W. C. Arsem

and H. I. Wood are in the research laboratory of the General Electric Company, Schenectady, N.Y.—P. L. Buxton is clerk of the corporation, The E. Buxton & Son Company, Worcester, Mass.—H. T. Blanchard is now located in New York City.—H. R. Healey is assistant chemist for the Cocheco Manufacturing Company, Dover, N.H.—V. F. Holmes is chemical engineer for Dravo, Doyle & Co., Pittsburgh, Pa.—J. E. Le Bosquet is secretary and general manager of the Le Bosquet Coal and Mining Company, Shawnee, O.T.—J. F. Lange is assistant on the engineering corps of the Pennsylvania Lines west of Pittsburg.—E. H. Pendleton is traveling salesman for the Worcester Salt Company, New York, N.Y.

BOOK REVIEWS

IRRIGATION IN THE UNITED STATES

BY FREDERICK HAYNES NEWELL, S.B., M. I. T. '85, Chief of the Division of Hydrography of the United States Geological Survey. New York: Thomas Y. Crowell & Co., 1902.

The problems presented by the vacant and arid lands of the United States can be solved only by comprehensive and judicious methods of irrigation. As the conditions vary widely in different portions of the country, each region must receive special study and treatment. To be a leader in such a work, one should have an extended and personal knowledge of the country and a magnanimity of purpose. With these Mr. Newell combines an ability to direct investigations, also to gather facts and correlate them from a wide range of sources. It is the aim of his division of the United States Survey to improve the opportunities of the farmer, the cattle-raiser, the fruit-grower, the forester, and the home-maker. The concerted efforts of all of these must be guided and aided by the national government to attain successful results. It is a gigantic enterprise.

Mr. Newell has written for the United States Survey several reports and numerous "Irrigation Papers," in which he has given a large amount of detailed information, of value to statesmen, engineers, and students of industrial resources. But these are not universally accessible, and it is important that the great work in the arid districts shall be sustained by an enlightened and general appreciation by the people. To secure this is one of the objects of Mr. Newell's recent book on irrigation.

The author has accordingly made a four-hundred-page volume of interesting reading matter without detracting from its evident merits as a general treatise upon irrigation. While the pictorial illustrations are clear and attractive, the maps and diagrams with their descriptive text deserve special consideration for their value. They

present in a condensed and graphic form the accumulated results of a long series of investigations, showing the unequal distribution of rainfall by localities as well as by seasons and months. They also show the importance of storing the waters of floods for the subsequent irrigation of lands which every year experience seasons or drought. In this and in other ways, the hydrographer of the United States Survey discusses the geologic, geographic, and climatic conditions of different regions, and successfully shows that there are millions of square miles in our country which may be made more productive and populous by a wise control of the natural forces.

The book contains illustrated descriptions of the processes by which the flow of streams is measured and the amount of available water determined. It treats of certain means which have been adopted and others which have been proposed, for the construction of reservoirs at judiciously selected places, and of the available means for transporting by canals or otherwise the surplus waters of some districts to tracts most severely in need. It also discusses the occurrences of underground water, and it describes the devices for raising water by wind or other power to vantage points from which it can readily flow. In the last portion of the book the diverse physical conditions and their problems are appropriately treated geographically by States.

The book is well adapted to serve its purpose for the wider dissemination of authentic information concerning irrigation, and it deserves a careful perusal by many thousands of citizens.

W. H. N.

Since the above was written there has appeared a "Report of Progress of Steam Measurements for the Calendar Year 1899," by F. H. Newell. It is contained in the Twenty-first Annual Report of the United States Geological Survey. It occupies 488 imperial octavo pages. It is a careful description and scientific discussion of the subject. It is illustrated by 48 photographic plates and 271 figures which include maps, diagrams, and sections.

W. H. N.

THE COST OF FOOD: A STUDY OF DIETARIES

BY ELLEN H. RICHARDS, '73. New York: John Wiley & Sons.
12mo. v + 161 pages. Cloth, \$1.00.

This is the second in one series of Mrs. Richards's books: it follows the "Cost of Living." It is thoughtfully arranged, and is valuable both to the student and to the household. The aim of the book is to study the relative cost of the right amount of the food-stuffs, when derived from the various food materials. There are chapters on kind, quality, and cost of food, food for the infant, for the school-child, for the active youth, for the youth at college, and for the brain-worker, for the traveller and the professional person, for those in penal and pauper institutions, for the person in a hospital, for those of middle life and for those of old age, and one on general principles governing dietaries. Then follow chapters on dietaries costing from ten cents to sixty cents per day, and finally one entitled "The Dietary Computer." There is a glossary of terms used and a bibliography.

H.